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Autumn Conference

ON Thursday and Friday, this week, the Association held the latest of those autumn conferences which have become, of recent years, so important and so valuable a part of its activities. On this occasion the subject was Supplements and Additives in Animal Feeding-stuffs, and once again notable contributions were made by specialists from within the profession and very welcome guests from other fields. The whole Proceedings will be published early in the New Year as a special number of THE VETERINARY RECORD, similar in style to the Proceedings of Congress, which are due to appear in about two weeks' time.

The fact that the B.V.A. should have organised such a conference, and should have welcomed as its guests the representatives of a great industry is but the latest example of the gradual, but fundamental, change in the life and work of our profession. The farm animal, if it is to attain its optimum state of health and its highest productivity, calls for combined knowledge and continuing research on the part of a team of specialists from soil chemists to pathologists; and among them the veterinary surgeon should be at once the co-ordinator and the executive instrument. Ideally, the range of his understanding should be such that he comprehends, in broad principle, the contribution made by each specialist and harmonises it into a system applicable to the practical needs of agriculture.

In this connexion it needs to be borne in mind, as was demonstrated in a Congress paper last year, that the modern farm animal tends increasingly to be something of a freak living in freakish conditions.

The Association's " grassland conferences " of a few years ago brought into prominence many new problems concerned with changes in husbandry; and if the nation's undue dependence upon imported feeding-stuffs is to be halted—or, better still, reversed—these problems have to be met and solved. It needs only such a crisis as that in the Middle East to re-emphasise the supreme importance of home-grown food; and to play a part—indeed a major part—in increasing agricultural production may be said to be the veterinarian's primary service to his fellow men.

The evolution of the farm animal into the high-yielding " food machine " of to-day is unlikely to be interrupted and cannot be reversed. We have to accept the situation forced upon us by economic pressures and by the relentless increase in the numbers of mankind, and devise the means to animal health, often in circumstances naturally inimical to it.

That diet is of the first importance is axiomatic, and it must equally be admitted that our knowledge in this field, and indeed our understanding of the processes of metabolism generally, are less than could be wished. However, the recognition of perplexities is the prerequisite to their solution, and many of the best minds in the profession are occupied with these problems. In considering them we have everything to gain by exchanges of view with others in complementary fields, not least in the harsh field of practical commerce. As is shown by the titles alone of the papers read during the last two days, an immense new field both in disease control and in the supplementation of diet for health and growth has opened over the past few years. There is accumulating evidence of the benefits of new dietetic practices, but there is also a body of evidence that warns against undue haste and the forming of too speedy and too optimistic conclusions. The moment was ripe for long and full discussion, such as has just taken place, between the scientist, the clinician, the agriculturalist, and the manufacturer; and such discussion, together with the cordial relationship established by the B.V.A. between the profession and the feeding-stuffs trade, is of value to the whole agricultural industry and may well have its effect far beyond these islands.

The Technical Development Committee, who originated this conference, are to be congratulated, as are the readers of such thoughtful and practical papers. Our own members, and our many guests who contributed to the discussions not only added to the meetings, but helped to increase the common stock of knowledge. The conference has fully justified the Association's time and trouble, and should be a very real source of satisfaction to all those who took part.

Aortic Thrombosis with Posterior Paralysis in the Cat

BY

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AORTIC thrombosis in the cat has been described by Holzworth *et al.* (1955) as occurring in the United States but it does not appear to have been recognised in this country.

In the belief that it has been unrecognised rather than uncommon, and in the hope that its description may direct the attention of others to the condition, it has been thought worth while to describe two such cases seen recently and confirmed *post mortem*.

Case 1

The subject was a spayed female cat 10 years of age at the time of destruction.

History

Two years prior to the final illness the cat was reported by the owner to have been found in a state of collapse, with cold extremities, pale membranes, and in some anxiety and distress. It was then supposed that it had met with an accident, and shock, with or without internal haemorrhage.

This was considered by the veterinary surgeon then attending to be the cause of the symptoms. A natural recovery was made over a period of a week to 10 days.

In the light of subsequent events it seems possible that this was, in fact, the first attack of thrombosis.

The cat was first seen by the author last August (1955) at the age of nine and a half years with an almost exactly similar history. It had been found in the garden near the road, collapsed, distressed, and dragging its hindquarters.

Examination

This showed a temperature of 99° F., femoral pulse not apparent, heart rapid on auscultation. All extremities were cool but the hind feet were intensely cold. Pedal reflexes were normal in the front feet but absent in the hind. The gastrocnemii muscular bellies on both sides were hard cramped and knotted and intensely painful. Anterior thigh muscles appeared normal and the legs could be brought forward voluntarily to some degree on handling them. The tail was cool but had some voluntary movement, and a definite pain reaction was elicited on pressure.

Diagnosis

At the time, prior to seeing the article by Holzworth *et al.*, a very tentative and partial diagnosis was offered of a circulatory disturbance of unknown origin.

X-ray investigation to eliminate the possible alternative diagnosis of spinal injury was, as was expected, negative.

Note.—*Case 1 was presented to the Central Veterinary Society at its meeting in March, 1956.*

Treatment

This was mainly symptomatic and did not apparently influence the course of the disease. Nynalgin* was given initially to relieve pain. Ascorbic acid 100 mg. daily orally, and daily injections of deproteinated pancreatic extract† were given in the hope of relieving muscular and/or vascular spasm.

Course

For one week, under daily observation, there was a gradual slow improvement. Pedal reflexes became brisker. The cat ate well, after refusing food for 24 hours, and was daily less distressed. Coldness of hind feet lessened in intensity.

At 10 days there was some voluntary movement of hind legs but the cat was unable to rise fully. The gastrocnemii were still hard and painful to pressure but the hind feet were markedly warmer.

At 18 days there was a definite effort to walk but both fetlocks were knuckled. The cat could rise unsteadily but unaided.

At 31 days the cat was walking much more steadily but still knuckled the right fetlock.

At 38 days there was no observable change and an elastoplast support was applied to the right fetlock. The owner was advised to leave it on for two to three days, then remove it and reapply if necessary.

At 45 days the owner reported that reapplication had not been necessary and the cat was walking normally.

Subsequent and last Recurrence

The cat was not seen again until January 16th, 1956, when it was brought in at night with an almost identical history. It had been found collapsed in the garden. On this occasion the general symptoms of shock were much more marked. The cat had vomited and passed fluid faeces and was generally cold to touch and showing tremor. Heart rate on auscultation was 96. Heart beat was irregular and arhythmic with occasional complete missing of the second sound. There were periods of up to 10 seconds at a time of complete regularity and rhythm followed by longer intervals of irregularity. The left foreleg was flaccid with diminished pedal reflex. There was no pain in it and the foot was cold. The right foreleg had a normal pedal reflex and the foot was merely cool. In both hind limbs there was a diminished pedal reflex and the feet were cold. The cat made crawling or swimming type of movements and was unable to bring the hind legs forward completely. The gastrocnemii were not so hard and painful as previously. Femoral pulse was again undetectable and temperature was 99° F.

* Novalgin (Bayer).

† Depropanex (Sharp & Dohme).

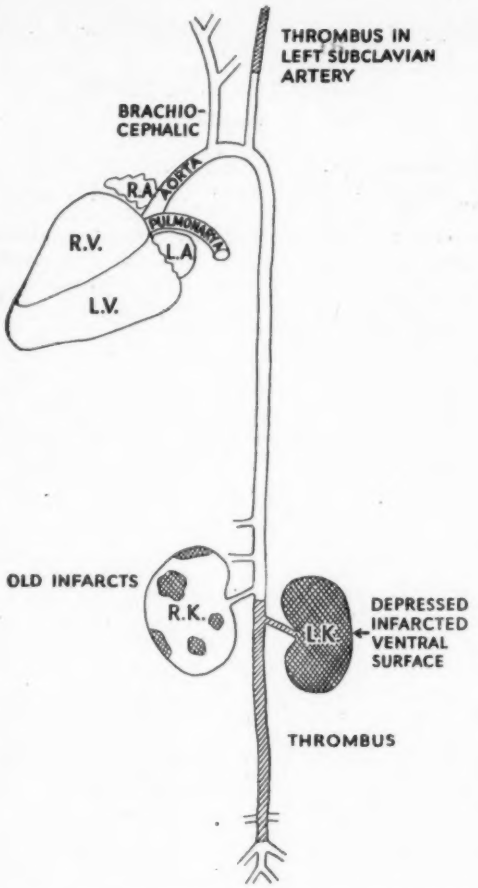

Fig.1. DIAGRAMATIC SKETCH OF SPECIMEN FROM CASE I

Diagnosis

After reading Holzworth's case reports it was considered virtually certain that this case was similar and a diagnosis of iliac or lower aortic thrombosis, together with a left subclavian thrombosis was now made. In view of the fact that this was considered to be the third attack and it was thought very unlikely that the cat would recover from the general heart condition and shock, destruction was recommended and carried out.

Post-mortem Findings

The alimentary canal was normal anterior to the colon which organ showed circular ischaemic areas in its wall. The liver showed pinhead haemorrhages. The right kidney showed five separate pits of infarcts of old standing. The left kidney was on its vertebral surface, entirely sunken and congested. The appearance suggested a recent deprivation of blood supply superimposed on an old infarcted area. The heart showed numerous white areas in the walls of the ventricles, but no endocarditis or thrombosis.

The aorta and its branches showed (1) a firm dark thrombus of even consistency (no concentric ringing), 2 cm. long, completely filling the left subclavian artery, the clot commencing 2.5 cm. from its origin, and (2) a similar thrombus filling the posterior aorta from the level of the left renal artery to a point 1 cm. above the branching into external iliacs. The thrombus measured 7.5 cm. in length, and was not attached to the vessel wall. It is regretted that the specimen from this case became damaged before a photograph could be obtained. A diagram of the areas of thrombosis is shown in Fig. 1.

Case 2

The subject was a 10-year-old castrated male cat.

History

There was no previous history of illness at any time. The cat had been let out in the early morning apparently normal, and was subsequently found collapsed and showing grave respiratory distress half an hour later.

Examination

The acute dyspnoea was the most marked symptom and on auscultation the respiratory noise and excessive movement of chest wall entirely prevented any possibility of hearing the heart sounds. Femoral pulse was not apparent and no estimate of heart rate was possible. There was a partial loss of use in the hind legs and the hind feet were cold. Handling of the anterior thigh muscles produced evidence of sensitivity and some forward movement. Pedal reflexes were absent. There was some voluntary movement in the tail. Temperature was 99° F. Visible mucous membranes were cyanosed.

Diagnosis

A tentative diagnosis of some cardiac crisis plus lower aortic thrombosis was made, although it was considered possible, owing to the history, that a street accident could have been responsible.

Treatment

The treatment was that generally prescribed for shock plus digitalis gr. ii followed by gr. i b.i.d. Penicillin was given in case chest infection followed.

Course

Reinspection 24 hours later showed a similar picture with an intensification of the coldness of hind feet. There was still no femoral pulse, and the heart was still inaudible owing to the extremely loud forced respiratory noises. Dyspnoea was intense. The diagnosis of thrombosis was confirmed and it was suggested that an undetected heart lesion was responsible for the cyanosis and the chest symptoms. Destruction was advised but refused by the owner, and the cat died during the following night.

Post-mortem Findings

The heart was very grossly enlarged but no macroscopic lesion except dilatation was seen. The aorta

was normal until a point 2 cm. above the branching of the external iliacs when it was filled with a moderately firm thrombus extending down to the iliacs. This thrombus was not attached to the vessel wall.

Further Suspected Cases

Apart from these two confirmed cases, two other cases of posterior paralysis, showing coldness of the hind feet and hardness and tension of the gastrocnemii, have been seen in the past but remained undiagnosed and made a natural recovery. One case of left foreleg paralysis and collapse was seen, which died within six hours but could not be obtained for *post mortem*. It seems virtually certain, in retrospect, that these were also cases of thrombosis.

Conclusion

Two cases of aortic thrombosis with posterior paralysis in the cat are described, and it is considered that these cases are similar to those seen by Holzworth *et al*.

The exactness with which the position of the clots could be predicted by evidence of local loss of blood supply was very noticeable, particularly in Case 1. Diagnosis would not appear to present any great difficulty although the acuteness of the initial crisis might mislead one into regarding the case as one of accidental shock. Diagnosis might again become difficult if the animal was not presented until the partial recovery stage when the feet were beginning to feel warmer again and the appearance was that of a partial paraplegia. The cramping of the gastrocnemii would, however, at this stage appear to be typical.

There would seem to be no reason why lower aorta and/or iliacs should always be affected and it seems likely that some cases of loss of function in foreleg and some cases of so-called stroke in cats would fit into the general picture of thrombosis. In fact one of the further suspected cases mentioned—that with the left foreleg paralysis—was in a state of apparent coma with marked nystagmus and it may well be that arterial blood supply to the brain was interrupted by a further clot.

It is suggested that the condition of thrombosis in the cat in this country is a not uncommon one, which has hitherto gone unrecognised.

Acknowledgments.—My thanks are due to Miss J. O. Joshua, F.R.C.V.S., who first drew my attention to Holzworth's work.

Reference

HOLZWORTH, J., SIMPSON, R., & WIND, A. *Cornell Vet.* **45**. 468.

Repair of Ruptured Uterus in a Cow—*Concluded.*

of trepidation that a call was made on the ninth day to remove the sutures.

We found the cow was in perfect health, the wound having healed by first intention, and the cowman said she was giving over 6 gallons of milk per day.

The entire operation including the actual calving took 2½ hours.

Repair of Ruptured Uterus in a Cow

BY

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ONE of us (T. S.) was called to a case of dystokia at 3 a.m. on May 20th, 1956. The subject was a four-year-old Friesian cow. Examination revealed a schistosomus reflexa, with what appeared to be a torsion of the vertebral column with resultant lateral or upward deviation of the hind limbs.

In view of the size of the animal it was thought that delivery could be accomplished using traction. This was applied and the foetus delivered in 10 or 15 minutes without undue stress to the cow, who got to her feet almost immediately. It was quite a shock to discover, on further examination of the uterus, a rent in the dorsal wall, 8 to 10 inches in length, running transversely. The utility of operation was discussed with the owner, and in view of the fact that the carcase value of the animal was only £35 to £40, while the "milk value" was nearer £100, operation was decided upon.

With the animal in the standing position, paravertebral anaesthesia was carried out. An area of the left flank was then clipped, shaved, and disinfected. By this time the left flank area was desensitised. A vertical incision was made about 8 inches in length, starting high up under the lumbar transverse processes and continued downwards almost twice the length of the normal rumenotomy wound. The muscle and peritoneum were likewise incised, exposing the abdominal cavity.

A double strand of No. 1 catgut and a curved suture needle were used. The free ends were knotted in case the needle was accidentally dropped while suturing. Both hands were inserted into the abdominal cavity and fairly close continuous suturing going through the parietal and muscular layers of the uterus was commenced. Four tubes of catgut were necessary to complete the operation. Suturing was rendered relatively easy by inserting the fingers of the left hand into the uterine wound and keeping the edges in apposition while suturing with the right hand. The wound was then liberally sprayed with crystalline penicillin in distilled water.

Only six or seven separate entries were made into the abdominal cavity, with all aseptic precautions. For the peritoneum a continuous No. 0 catgut was used. The skin and muscle layers were brought into close apposition using four halsted sutures of nylon twist. These were tied off and the partially everted edges of the wound liberally sprayed with crystalline penicillin. The skin was then sutured using one long continuous nylon twist suture. Some sulphanilamide wound powder was dusted on the wound and the entire operation was complete.

The owner was instructed to telephone should the cow go off her food, or should she retain the cleansing. No news was heard, and it was with a certain amount

(*Concluded at foot of preceding column*)

A Micro Complement-fixation for Johne's Disease and its Application to Diagnosis in Cattle and Sheep

BY

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PART I

Technique of the Test and Studies on Antigens

IN recent years studies on the complement-fixation test have shown great promise for its use in the diagnosis of Johne's disease. Hole (1952a, b, 1953) reports on the use of a complement-fixation test for the diagnosis of the disease in United Kingdom cattle. His results show that in clinically suspected cases the test is a very useful means of confirming diagnosis during life, and he concludes that this test is superior to faecal examination and other diagnostic techniques. In pre-clinical cases the test is of promise in herds in which the disease is a common occurrence. A degree of cross-reaction occurs with sera from tuberculosis cases. Studies on the use of the Hole test under New Zealand conditions (Chandler, 1955) confirmed the results obtained by Hole in the United Kingdom.

A search was made at Wallaceville for a complement-fixation test that would reduce the amount of apparatus and time required by the Hole test and subsequently result in staff economy. It was decided to develop a test for use on perspex trays of the type commonly used for virus haemagglutination tests; Greenbury & Keningale (1954) describe the use of these trays in a Wassermann test. The test to be described is believed to be the first veterinary bacteriological test conducted using these trays. An antigen was developed specifically for use in the test. Preliminary results of the test (Chandler, 1956) were very promising; further studies on the test are now described.

Apparatus and Reagents

1. *Perspex Trays**.—Size 18 cm. by 14 cm. by 1½ cm. with 80 countersunk "cells" of diameter 1.5 cm. and capacity 1.5 c.c. These trays were washed after use with tap water, then distilled water, dried and retained in a dust-free cupboard or large envelope. Their use, in place of the usual Wassermann tubes, results in a great saving in time, washing facilities, and apparatus. For the stage of the test requiring incubation at 37° C. the whole tray is placed in an incubator; during the period this entailed (half to three-quarters of an hour) there was no appreciable evaporation of the reagents in the "cells." Lids of perspex may be used to cover the trays, if required.

2. *Sera.*—Whole blood samples were received for testing, the serum recovered and inactivated to remove complement and anti-complement. An inactivation temperature of 56° C. is sufficient to destroy complement, but Hole (*loc. cit.*) found this did not destroy all the anti-complement in bovine sera and, as a result, included the centrifugation stage in his method. Sigurdsson *et al.* (1945) using ovine sera, found that an inactivation temperature of 62.5° C. was necessary to destroy anti-complement; this temperature did not destroy antibody but higher temperatures did so. Experiments conducted at Wallaceville, using bovine sera and inactivation temperatures of 56° C. and 62.5° C., indicated that the higher temperature destroyed all anti-complement, did not destroy detectable antibody, and furthermore clarified the reading of the test. Similarly, it was shown that an inactivation temperature of 56° C. was ineffective in destruction of anti-complement which was very common in ovine sera, whereas the 62.5° C. temperature destroyed all anti-complement and did not appear to affect the detection of antibody.

Accordingly both bovine and ovine sera were inactivated at 62.5° C. for 30 minutes. At this temperature undiluted sera occasionally jellied; bovine sera was therefore inactivated in 1/5 dilution (the dilution used in the test); with ovine sera inactivation in 1/2 dilution was needed since in 1/5 dilution some sera remained anti-complementary.

3. *Volumes.*—The test was designed to use equal volumes of all four reagents (serum, antigen, complement, and haemolytic system) in the test proper. For use with pipettes 0.1 c.c. volumes were chosen, since this amount could easily be measured from graduated 1-c.c. pipettes, and the total volume of 0.4 c.c. allowed agitation of the plate for mixing and provided a clear reading of the result. The test was later run using drop-burettes delivering drops of approximately 0.05 c.c.; this greatly increased the speed of the technique and provided sufficient total volume for clear reading and manipulation.

4. *Saline.*—Normal saline gave good results but higher and more constant complement titrations were obtained by the addition of 0.1 g. per litre magnesium sulphate, according to Kolmer (1944). Use of a buffer saline containing magnesium might offer a further improvement.

5. *Test Dilutions.*—The Hole test employs two dilutions of sera, 1/5 and 1/10. However, the reading of the result depends basically on the 1/5 dilution—complete fixation being positive and complete haemolysis being negative. In the micro complement-fixation test the 1/5 dilution only is used.

6 *Complement.*—This was obtained on the day of the test from male guinea-pigs that had been starved overnight. Samples of complement could be stored in a deep-freeze as whole serum for at least two weeks with no appreciable fall in titre.

7. *Haemolysin.*—This was obtained from the Commonwealth Serum Laboratory, Australia.

8. *Haemolytic System.*—This was prepared by the addition of the haemolysin solution to a 6 per cent. suspension of normal sheep red cells in the saline. This produced haemolytic system containing 3 per cent. red cells and 5 M.H.D. haemolysin.

9. *Complement Titration.*—The perspex trays were used, dilutions of complement prepared from 1/20 to 1/150, and titrated in the usual manner at 37° C. for 30 minutes. The titre was read as the greatest dilution showing complete haemolysis. Complement was then prepared at 2 M.H.D. for the test proper.

Conduct of the Test

Preparation of haemolytic system, complement, inactivation of sera, and complement titration are carried out in the morning of the day of the test. The test proper is run in the afternoon as follows:—

1. *Stage of Fixation.* Sera, then antigen, and finally complement are added to the trays, which are left at room temperature for one hour.

* Obtainable from Prestware Ltd., Lombard Road, London.

2. *Stage of Haemolysis.* Haemolytic system is added and the tray incubated at 37° C. for three-quarters of an hour, being occasionally agitated by hand.

Controls.—Serum, antigen, and red cell fragility controls are used. In addition, at least one known positive and one known negative serum are used in each test.

Reading of the Test.—Before reading the tray is allowed to stand on the bench for five minutes to allow sedimentation of red cells. The results are usually clearly defined and interpretation is simple. Complete fixation in the test "cell" is read as positive, complete haemolysis as negative, and any intermediates as doubtful.

Studies on the Antigen

Sigurdsson (1945b, 1946, 1947) has described an antigen prepared from the gut of sheep affected with Johne's disease. His method of extraction consisted of drying the affected mucous membrane, grinding it in a ball mill, making a preliminary saline extraction at *p*H 4 which is discarded, and a final saline extraction at *p*H 9.5 which is neutralised and constitutes the antigen.

It was considered by the present author that Sigurdsson's antigenic material was derived from the bacilli present in the affected gut; Johne's bacilli exist in affected sheeps' gut in enormous numbers. It was accordingly decided to use similar extract methods on pure *M. johnei* culture material.

Experimental Procedure

A bovine strain of *M. johnei*, obtained from Weybridge Laboratory, was cultured on Reid's synthetic medium, without the addition of *M. phlei*. The culture is autoclaved at 15 lb. pressure for 20 minutes, filtered over Whatman No. 1 filter paper in a Büchner funnel, washed in saline, and roughly dried. The bacilli are placed in a low-temperature refrigerator (−15° C.) for one to two hours then complete drying from the frozen state is carried out in a vacuum desiccator over phosphorus pentoxide. (Alternatively drying may be carried out using a vacuum embedding bath at 40° C., as used by Sigurdsson.) Defatting is carried out by standing the dried bacilli in acetone (1 g. per 100 c.c.) for 24 hours, and occasionally shaking. The bacilli are then filtered off and quickly dried under negative pressure. One-half to 6 grammes of the dried defatted bacilli are then ground in a ball mill. The mill used is a B.T.L. planetary mill, Type C17/026, and is loaded with 22 marble balls of diameter approximately 1 cm. (A B.T.L. Laboratory ball mill, type C17/032 was not satisfactory for this purpose.) The bacilli are pulverised at approximately 250 r.p.m. for a period varying from two to five hours until the great majority of bacilli no longer stain acid-fast with Ziehl-Neelsen stain, appearing as a blue-staining amorphous mass. 0.5 g. of the pulverised bacilli is taken and extracted with 50 c.c. saline adjusted, using a *p*H meter, to *p*H 4 with hydrochloric acid. The extraction is carried out in a flask, with a few beads to facilitate shaking, at room temperature, for one hour. The extract, which has been shown to be of no antigenic value itself, is discarded as supernatant after centrifugation. The main extraction is then made with 50 c.c. saline, adjusted to *p*H 9.5 with sodium hydroxide, at 100° C. for one hour. The antigen is recovered as filtrate after filtration through Whatman No. 1 paper, or alternatively as supernatant after centrifugation, and its *p*H adjusted to 7.2.

The antigen is clear or faintly opalescent; 0.3 g. per cent. phenol is added as a preservative. The antigen is retained in the refrigerator though this may not be necessary. One sample was frozen but no subsequent loss of activity was noted. It is thus an extremely stable reagent. Effective antigen titres have varied with different growth batches of antigen, but 0.5 g. of the dried bacilli produces sufficient antigen for the testing of 1,000 to 8,000 sera using the micro complement-fixation test. The antigen was designated micro-antigen I.

Other Antigens Prepared and Studied

i. Micro-antigen prepared by shorter method. It was decided to prepare, if possible, batches of antigen omitting various stages of the preparation. The various batches of antigens were prepared from the same stock dried *M. johnei*, in order to eliminate any question of difference in potencies of various stocks; each short method antigen was compared with antigen produced by the standard method, against the same known positive and negative sera in the same micro complement-fixation test. Antigen prepared by the omission of defatting or omission of the preliminary *p*H 4 extraction gave the same titre as the standard antigen, indicating that defatting is not necessary. Omission of grinding resulted in an appreciably lower titre of antigen, indicating that grinding of the dried autoclaved bacilli is necessary to produce a satisfactory yield. These studies indicated that the only basic stages necessary to produce micro-antigen are grinding of the dried autoclaved bacilli and making the alkaline extraction at 100° C.

ii. Antigens containing johnin. McIntosh & Konst (1943) describe increased yields of johnin (PPD) by making the culture alkaline to *p*H 8 before the autoclaving process.

A screw-capped 500 c.c. bottle containing a growth of *M. johnei* on Reid's medium was adjusted to *p*H 9.5 with sodium hydroxide, using phenolphthalein as indicator, placed in the waterbath at 100° for one hour with occasional shaking (facilitated by the addition of beads), filtered through Whatman No. 1 paper and the filtrate neutralised. This preparation would therefore contain an unconcentrated johnin, which had been produced at alkaline *p*H. Complement-fixation tests showed the preparation to be a very promising antigen, but some degree of anticomplementary effect was obtained in a high proportion of cases.

It was considered that the anticomplementary effect noted in the previous preparation was due to products of the medium. An antigen was therefore prepared as follows: *M. johnei* grown on Reid's medium, was filtered and washed in saline. Two grammes of these viable washed bacilli (dried between filter papers for weighing) were extracted with 50 c.c. saline at *p*H 9.5 for one hour at 100° C. The final product was recovered by filtration through Whatman No. 1 filter paper and neutralised. This antigen, designated "Micro-antigen II," has been tested, in comparison with micro-antigen I, against 95 positive and 56 negative sera and has given results equal to micro-antigen I; this new antigen has shown effective titres with no anticomplementary effect at these titres, and may replace micro-antigen I as the antigen for the micro complement-fixation test.

iii. Standard Allergens used as Antigens. It was decided to investigate the complement-fixing ability of standard commercial allergens. Dilutions of the latter in saline were prepared and titrated against known positive and negative sera in a micro complement-fixation test, using micro-antigen in comparison. The allergens tested were: "Synthetic" johnin, "Synthetic" mammalian and avian tuberculins produced by the Commonwealth Serum Laboratories, Australia, and avian *PPD* tuberculin produced by Weybridge Laboratory, England. The allergens were anticomplementary at 1/1 dilution and, with the exception of avian PPD tuberculin, of poor or no antigenic value at higher dilutions. Avian PPD tuberculin had little or no antigenic activity at 1/10 dilution, and a variable, though promising antigenic activity at 1/2 and 1/5 dilution. It is apparent that there is some promise in using a commercial allergen as a complement-fixing antigen; a PPD johnin would be worthy of investigation.

Nature of the Antigens

The final stage in preparation of micro-antigen I and micro-antigen II consists either of centrifuging and retaining the supernatant (as in Sigurdsson's antigen) or in filtering through Whatman No. 1 filter paper and retaining the filtrate. Neither antigen shows a suspension visible to the naked eye; however, examination of a smear of micro-antigen II stained by Ziehl-Neelsen method showed a number of acid-fast bacilli which had passed the filter paper. The filtrate of micro-antigen I and of micro-antigen II, after passing through a Seitz filter, is antigenic, though of reduced value, and furthermore, acts as an allergic agent in sensitised animals. It is possible that the antigenic factor of micro-antigen II consists of either a soluble substance very closely allied to johnin (which may be partly adsorbed on a Seitz filter pad) or of a mixture of dispersed alkali-treated bacilli together with a soluble substance closely allied to johnin (the latter may be partly adsorbed on the treated bacilli). Similarly micro-antigen I may consist of a soluble substance closely allied to johnin, or of a mixture of this and dispersed particulate matter derived from the bacilli. The constitution of Sigurdsson's antigen may also be similar.

Micro-antigen I, prepared by the longer method, was used for all the tests to be described in Part II. Micro-antigen II is more easily prepared, however, and in its preliminary tests gives promise that it will replace micro-antigen I.

PART II

Studies on Cattle

Studies were made using the micro complement-fixation test on New Zealand cattle affected with Johne's disease, on apparently healthy cattle, and on cattle suffering from tuberculosis.

A portion of the sera tested by the micro complement-fixation test ("micro-test") were also submitted to the test described by Hole (*loc. cit.*).

It must be noted that the Hole test as used in the United Kingdom is tested against cattle from tuberculosis-free herds; in the New Zealand studies, freedom from tuberculosis could not be guaranteed in all cases since sufficient numbers of tuberculosis-free herds with Johne's disease do not exist; in view of the cross-reaction with tuberculous sera therefore one cannot expect either complement-fixation test to give as clear or as accurate results as could be obtained under Hole's United Kingdom conditions.

Materials and Methods

Micro-antigen I, prepared by the longer method, was used throughout. The test has been described in Part I.

Ileo-caecal examinations consisted of examination of smears stained by Ziehl-Neelsen method for the presence of mycobacteria.

Results

Class A. Results with sera from clinically suspected cattle

(a) Clinical suspects from which ileo-caecal specimens subsequently obtained. (See Table I.)

TABLE I

		Micro test	Hole test
103 Clinical suspects from which ileocaecal (i/c) specimens were obtained	50 + i/c	42+ 2D 6−	43+ 1D 6−
	31 − i/c	22− 2D 7+	19− 4D 8+
	22 − i/c	19− 3+	Not tested

It will be seen from Table I that of 50 cases of clinical Johne's disease, 84 per cent. gave a positive micro-test result, 4 per cent. doubtful, and 12 per cent. negative test. For the same 50 animals the Hole test gave 86 per cent. positive, 2 per cent. doubtful, and 12 per cent. negative results. The results of both tests are therefore very similar, 12 per cent. of animals are not detected by either test; this may be due to absence of complement fixing antibodies in their sera or presence of "pro-complement" which masks their detection.

The micro complement-fixation test produced 77 per cent. negative, 19 per cent. positive, and 4 per cent. doubtful results with sera from animals whose ileo-caecal examinations showed no evidence of the disease. The 19 per cent. positive results may well include those from cattle whose infection was not detected by the ileo-caecal examination. Hole's test produced 61 per cent. negative and 26 per cent. positive results; here again some of the positive results may have been correct in spite of ileo-caecal examination.

It may thus be said that the micro-test is 84 per cent. efficient in detecting suspected clinical cases and *at least* 77 per cent. efficient in proving suspects free of Johne's disease. The Hole test in the same instances and using the same criteria is 86 per cent. and 61 per cent. efficient respectively.

(b) Clinical suspects for which no ileo-caecal specimens but Hole Test results were available. (See Table II.)

TABLE II

Total suspects	Micro test	Hole test
353	64 positive 28 doubtful 261 negative	93 positive 62 doubtful 198 negative

It will be seen from Table II that the micro-test provided 18 per cent. positive and 74 per cent. negative against the Hole tests 26 per cent. positive and 57 per cent. negative. It was further noted that practically all sera positive to the micro-test were also positive to Hole's test, and that most sera negative to the Hole test were also negative to the micro-test.

Class B. Results with sera from two freezing-works

Sera and respective ileo-caecal specimens were collected from two major freezing-works in New Zealand.

(a) *Sera and specimens from Wellington freezing-works.* Sera and corresponding ileo-caecal specimens were collected by the author at a Wellington freezing-works. This works handled cattle from the Wellington Province, where no cases of Johne's disease have occurred for some years. No evidence of Johne's disease was found on examination of the ileo-caecal valve specimens. Certain of the cattle were shown at meat inspection to be suffering from tuberculosis and these will not be considered here. The results were compared with the Hole test (Table III). None of the cattle were clinically suspicious at *ante-mortem* examination.

Of 64 cattle apparently free of Johne's disease *and* free of tuberculosis, the micro complement-fixation test gave 97 per cent. negative and 3 per cent. doubtful results. For the same sera the Hole test gave 82 per cent. negative and the remaining 18 per cent. positive or doubtful. The indications are that the micro-test was more accurate than the Hole test in this respect.

TABLE III
FREEZING WORKS SPECIMENS

Class	Micro test result	Hole test result
Wellington Freezing Works.	62—/64	52—/64
64, cattle apparently free of Johne's		6+/64
disease and tuberculosis	2D/64	6D/64
Waitara Freezing Works.	72—/76	53—/76
76, cattle apparently free of Johne's	1+/76	4+/76
disease but some of which were	3D/76	19D/76
affected with tuberculosis		

(D = doubtful)

(b) *Sera and specimens from Waitara freezing-works.* Sera and corresponding ileo-caecal specimens were obtained by the author from Waitara freezing-works in the Taranaki Province of New Zealand. Certain of the cattle were suffering from tuberculosis but owing to the design of the works, speed of slaughter, and assistance available, it was not possible to correlate these with the specimens.

Of 76 cattle apparently free of Johne's disease but some of which were affected with tuberculosis, the micro complement-fixation test provided 95 per cent. negative, 1 per cent. positive, and 4 per cent. doubtful results. Hole's test provided 70 per cent. negative results, 25 per cent. doubtful, and 5 per cent. positive. In respect of these sera and the evidence available the micro-test was preferable to the Hole test. The large proportion of doubtful and positive results obtained using the Hole test were probably due, at least in part, to cross-reaction with tuberculous sera.

Class C. Results with sera from herds suffering with both Johne's Disease and Tuberculosis

Herd 1. This herd had for some years lost animals from Johne's disease; tuberculosis was also prevalent and the herd was submitted by the local veterinary surgeon to the tuberculin test and positive animals sent for disposal. This provided an opportunity to study the complement-fixation tests; the results obtained are described below and summarised in Table IV (*opposite*).

From 23 cattle, positive to the tuberculin test and shown to be suffering from tuberculosis at meat inspection, 22 negative and 1 positive ileo-caecal specimens were obtained. For these 22 negative specimens Hole test gave 7+, 5D, and 10— results on the corresponding sera, while the micro-test gave 1+ and 20— results (one serum not tested by micro-test). From five cattle, positive to the tuberculin test but showing no visible lesions of tuberculosis and showing no evidence of Johne's disease, the Hole test gave 1+, 1D, and 3— results, while the micro-test gave 1+ and 4— results. One case of skin tuberculosis, with no evidence of tuberculosis or Johne's disease, gave a positve tuberculin test, a doubtful Hole test, and negative micro-test. One case of generalised tuberculosis, with no evidence of Johne's disease, gave a doubtful tuberculin test and positive Hole and micro-test. Six cattle showing no evidence of tuberculosis (and in at least four of the six, no evidence of Johne's disease) gave 1D and 5— results with the Hole test, and 6— results with the micro-test.

The evidence therefore suggests that the micro-test is more accurate than the Hole test, and that the many positive and doubtful results given by the latter are due, at least in part, to cross-reaction with tuberculous sera.

Herd 2. This was a herd, known to be suffering from tuberculosis and Johne's disease, from which the owner wished to eradicate Johne's disease. The results of examination of sera submitted by the local veterinary surgeon are given in Table V and described below.

TABLE V

	Sera	Micro test	Hole test
	57 sera	3+	10+
		2D	5D
		51—	42—
		(one not tested)	
14 of the above sera	13 sera from cattle with negative i/c	11—	9+
		1+	4D
		(one not tested)	
	1 serum from a cow with positive i/c	1+	1+

Sera from 57 cattle were examined by the Hole test which showed 10 positive, 5 doubtful, and 42 negative. Fifty-six of these sera (one serum positive to the Hole test was missing) were later examined by the micro-test which showed 3 positive (also positive to the Hole test), 2 doubtful, and 51 negative.

TABLE IV

	Tuberculin test	Showing tuberculosis *post-mortem*	Ileo-caecal examination	Micro test	Hole test
39 cattle, some suspicious of Johne's disease or tuberculosis	29+	23+	22−	1+. 20− 1 missing	7+ 5D 10−
			1+	Broken in transit	Broken in transit
		5−	5−	1+ 4−	1+ 1D 3−
		1 " skin tuberculosis "	—	—	D
	1D	1 (generalised tuberculosis)	−	+	+
	9−	1 not killed	—	—	D
		6−	4− (2 missing)	6−	1D 5−
		2+	2−	2−	1D 1−

The owner was *not* advised to slaughter any cattle on the basis of these tests which were still in an investigational stage. However, the 10 cattle positive to the Hole test and the 4 doubtful were slaughtered. One beast showed generalised tuberculosis and, of the 14 ileo-caecal valves examined, only one was considered positive for Johne's disease. Sera from 13 of these 14 cattle were later shown by the micro-test to give 2 positive results (one of which corresponded to the positive ileo-caecal specimen) and 11 negative results.

Class D. Results with sera from herds affected with Johne's Disease

Sera were obtained by the author and local veterinary surgeon from herds which had a history of Johne's disease for several years. These sera were taken from apparently healthy animals, *i.e.* the test was used in its pre-clinical sense. It must be noted that tests were only conducted on one or two occasions on these cattle; repeated re-testing over a period of years, together with collected *post-mortem* data, is necessary to evaluate the test thoroughly.

Herd 1. This herd has a history suggesting that the disease has existed on the property for over 10 years. Three years ago positive ileo-caecal specimens were obtained and have since been received yearly. Sera were examined from 49 milking cows, none of which showed clinical signs of Johne's disease. The micro complement-fixation test gave 1 positive, 4 doubtful, and 44 negative; the Hole test gave 4 positive, 6 doubtful, and 39 negative results. These results, especially those of the micro-test, did not indicate that at the time of the test there was much Johne's disease present. (A Hole test conducted on the same cattle nearly a year previously had shown 8 to give positive results.)

Herd 2. This herd has had a history of Johne's disease over the past 10 years, but no evidence of tuberculosis. (The cattle are not tuberculin tested but there have been no clinical cases of tuberculosis and no carcases have been condemned at slaughter). From 1948 to 1953 the number of cows culled for Johne's disease varied from two to three per annum; in 1954 seven were culled for the disease. The total number of milking cows on the property is at present about 60. At the end of 1955 a micro complement-fixation test was conducted on all of the 66 milking cattle with the following results: 1 positive, 3 doubtful, 62 negative. The Hole test on the same sera gave 4 positive, 7 doubtful, and 55 negative. Both tests gave comparatively few positive and doubtful results. It is likely that, on the basis of previous data, the results of the micro-test are more significant than those of the Hole test.

Class E. Results with sera from cattle intended for export

There is a considerable export of dairy cattle from the North Island of New Zealand, some being sent to foreign countries and others to South Island, the latter being termed " Inter-island cattle." All these cattle, many of which originate from Johne's disease areas in Taranaki and the Waikato, are clinically examined and, in addition, are required to pass the johnin test.

In 1955 several hundred young dairy stock were purchased by Japan, and the micro complement-fixation test was required to be conducted on their sera in addition to the johnin test. 1,081 sera were examined; 4 were positive, 30 doubtful, and 1,047 negative.

" Inter-island " cattle were submitted to both micro and Hole tests, during the latter part of 1955. For 57 sera examined, the micro-test gave 1 positive and 56 negative results; the Hole test gave 3 positive, 1 doubtful, and 53 negative.

It is considered that only very few positive and doubtful reactions were obtained owing to the health and also, to a great extent, the age of the stock tested. This latter observation would confirm work by Hole (*loc. cit.*) who reports few positive tests obtained with young stock; it is likely that they are too young to have developed appreciable non-specific antibodies, and, at least up to one year, are below the age at which Johne's disease is manifested.

PART III

Studies on Sheep

Johne's disease of sheep exists on a number of properties in the South Island of New Zealand (Williamson & Salisbury, 1952; Armstrong, 1956). The incidence of the disease in most of the affected flocks is comparatively low. The causal organism has been isolated by the present author but it is not yet known whether it is the "bovine" or the "Icelandic" variety.

Sigurdsson *et al.* (1945a) have described a complement-fixation test for Johne's disease of sheep in Iceland; their antigen consisted of an extract from infected sheep gut; in view of the distance of the infected New Zealand properties from the laboratory, the necessity of having infected sheep gut available for antigen would have presented difficulties.

Studies have been carried out in New Zealand to ascertain the use of the micro complement-fixation test as a diagnostic agent in the affected flocks. Ovine sera can be tested at the same time as bovine sera with this test. The test is used for sheep in the same manner as for bovines except that sera are inactivated at 1/2 dilution instead of 1/5 dilution as discussed in Part I.

Results

The results are shown in Table VI, and discussed below.

TABLE VI

Class	Diagnostic data	Micro test result
21 sheep, clinically suspected of Johne's disease, subsequently examined *post-mortem*	15 sheep, showing positive intestinal specimens	12+ 2D 1— (this intestine smear showed very few organisms)
	6 sheep, showing negative intestinal specimens	5— 1+ (this sheep also showed positive faeces)
32 sheep, clinically suspected of Johne's disease, whose faeces were examined	12 sheep showing positive faeces	10+ 1D 1—
	20 sheep showing negative faeces	15— 1D 4+
26 sheep "sensitised" artificially with a bovine strain of *M. johnei*	Vaccinated subcutaneously with 5 mg. of heat-killed *M. johnei* suspended in mineral oil	26+
70 sheep showing no evidence of Johne's disease	Born and bred on a Johne's disease-free property	69— 1D

It will be seen from the table that, of 15 clinically suspicious sheep from infected properties, whose subsequent intestinal examination (microscopical examination of smears stained by Ziehl-Neelsen method) was positive, 12, *i.e.* 80 per cent., gave a positive micro complement-fixation test, 2, *i.e.* 13 per cent., doubtful, and 1 a negative test.

Of six clinically suspicious sheep, whose subsequent intestinal examination was negative, five, *i.e.* 83 per cent., gave negative results.

Results of sera from sheep whose faeces were examined are also listed. (It may be said that in most cases a positive faeces examination indicates the presence of the disease, but the converse does not apply). Of 12 clinically suspicious sheep showing positive faecal examination (and therefore likely to be infected) 83 per cent. gave a positive complement-fixation test result. Of 20 clinically suspicious sheep showing negative faecal examination (but not necessarily free of infection) 75 per cent. gave a negative complement-fixation test result.

Twenty-six sheep of various age and sex, which had been "sensitised" by vaccination subcutaneously with 5 mg. of heat-killed *M. johnei* suspended in mineral oil, all gave strong positive complement-fixation test reactions.

Seventy sheep, showing no evidence of Johne's disease, and born and bred on a Johne's disease-free property, gave 69, *i.e.* 98 to 99 per cent., negative complement-fixation test reactions.

Summary and Conclusions

A micro complement-fixation test for the diagnosis of Johne's disease in cattle and sheep has been developed. The test is carried out on perspex trays and offers ease of conduct and economy of staff. Two antigens have been developed for use in the test; both are derived from a bovine strain of *M. johnei*.

Studies with the micro complement-fixation test in cattle have shown it to be a very useful diagnostic agent and very comparable with the Hole test. Under the circumstances of the investigations, the micro-test was at least 84 per cent. efficient in detecting suspected clinical cases of Johne's disease, and at least 77 per cent. efficient in showing suspects free of the disease, even when these suspects could not be guaranteed free of tuberculosis. In cattle sent to freezing-works and believed to be free of Johne's disease, but not in all cases free of tuberculosis, the micro-test was 95 to 97 per cent. efficient in showing the animals free of Johne's disease. It is of interest that among the freezing-works cattle which, on the bases of ileo-caecal specimens, were believed free of Johne's disease, the micro-test gave 95 to 97 per cent. negative results, whereas in clinical suspects similarly believed free of Johne's disease, the micro-test gave 77 per cent. negative results. It is possible that the micro-test in the latter animals detected Johne's disease which was not detected in the ileo-caecal examination, or that these animals, originating in the main from Johne's disease properties, were "sensitised" by the bacilli. The results with herds suffering from both Johne's disease and tuberculosis indicate that, under the circumstances of the investigation, the micro-test was preferable to the Hole test. It is possible that the micro-test may be of use, when used in a pre-clinical sense on whole herds that have a history of Johne's disease. The micro-test may also be used as a test for transit cattle particularly where adult animals are concerned.

The micro complement-fixation test appears very promising for use in sheep. It will be noted that micro-antigen is derived from a bovine strain of *M. johnei* but is nevertheless very efficient in the case of the infected New Zealand sheep; in any event the true ovine varieties grow so sparsely that it is unlikely that sufficient could be grown to make an antigen. However the varieties are likely to be so closely related that a preparation of one would provide a diagnostic agent for the other. The complement-fixation test appears remarkably accurate in the case of healthy sheep and sensitised sheep. It is likely that its accuracy in clinically suspicious sheep is even higher than indicated by the results, since the supporting data such as intestinal examination is not in itself an absolute criterion. It is apparent that in clinically suspicious sheep the test is *at least* 80 per cent. effective in detecting positive cases and *at least* 83 per cent. effective *in proving suspects free of the disease*.

Acknowledgments.—I wish to thank Messrs. R. M. Salisbury and M. B. Buddle for their interest and encouragement, Messrs. D. Harrison and L. Hart for their advice, and Mr. M. C. Armstrong for introducing the author to the problem of the disease in sheep.

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FOR AMATEUR ARTISTS

The 29th exhibition of works of art produced by doctors, dentists, pharmacists, and veterinary surgeons will be held at the Musée d'Art Moderne, Paris, from January 13th to 27th, 1957. There will be separate sections for paintings, sculptures, photography, and decorative and applied art. As in previous years the Minister of Public Health will award medals for the best exhibits. Contributors should send details of their works to the secretary, Dr. Malet, 67, Ave. Pierre Larousse, Malakoff (Seine), France, and include name, address, qualifications, title of contribution, etc., not later than January 1st. The exhibits themselves, which should also bear the same information, should be despatched to Messrs. Davies, Turner Ltd., 47, Graham Terrace, London, S.W.1, early in January.

In Brief

BOVINE HEPATIC DISEASE

THE pathogenesis of two important liver diseases has recently been elucidated.

Telangiectasis, often wrongly called caverous haemangioma, is a replacement and displacement of hepatic parenchyma by blood-filled spaces which leads to the condemnation of many livers at meat inspection. Anderson (1955), in America, has shown that this is largely a disease associated with the feeding of concentrates of the "feedlot," *i.e.*, when beef cattle are switched to a diet with a high ratio of concentrates to roughage. The severity and extent of lesion are directly proportional to the length of time spent in the feedlot. The pre-telangectatic lesion consists of the accumulation of glycogen between the hepatic cell and the sinusoidal endothelium. This glycogen is discharged into the sinusoid, its place being taken by blood which erodes the hepatic cell column, the continuation of this process leading to large blood-filled spaces by both erosion and pressure displacement. The precise dietary constituent causing the pretelangiectasis was not identified but experiments suggested that the absorption of hydrogen sulphide from the bowel might be responsible.

Another disease, important to both the clinician and the meat inspector, is necrobacilooisis, liver abscesses caused by *Fusiformis necrophorus*. Jensen *et al.* (1954) have shown that there is a statistically significant correlation between rumenal ulceration and rumenitis and hepatic abscesses. By injecting the organism into the portal vein they were able to "age" the liver abscesses and have shown that this complex, too, is associated with a sudden switch to a concentrate diet such as occurs in the "feedlot." The series of events is (1) high concentrate diet, (2) rumenal lesion, (3) colonisation of these by *F. necrophorus*, (4) the latter thus gain entry into the portal vein and thus (5) reach the liver and produce abscesses.

W. F. H. JARRETT (Oct., 1955).

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MEAT INSPECTION IN LANCASHIRE

A considerable increase in duties connected with meat inspection is reported by the Lancashire county medical officer of health. In his annual report he states that 172 private slaughterhouses have been licensed and that eight public abattoirs were in operation. It is the practice to carry out complete *post-mortem* examinations at all such establishments, but *ante-mortem* examination of all animals is confined to relatively few districts. The percentage cattle affected with disease, other than tuberculosis and cysticercosis, was 27.5.

THE 1956 CONGRESS

Attendance List

The following is a list of those members of the Association who signed the Attendance Register. We regret that there are a few omissions as we were unable to decipher some of the signatures.

Abbott, S. G., Allen, C. G., Anderson, T. S., Ashton, P. K., Atkinson, G., Baker, F. C., Barbour, D. S., Barbour-Lomax, J. W., Barker, I. R., Barnett, Keith, Barnsley, D. G. C., Barron, N. S., Barton, C. R. Q., Bate, T. C., Baxter, J. D., Bayliss, J., Beach, J. E., Beesley, C. J., Begg, Hugh, Beveridge, C. G. L., Beveridge, W. I. B., Beynon, A. G., Black, N. McG., Blaxland, J. B., Boddie, Professor G. F., Bonallo, T. G., Bowden, Rufus S. T., Bowen, D. E., Boycott, B. R., Brancker, Miss W. M., Brook, G. S., Brown, A. C. L., Brown, James A., Brown, P. L., Brownell, T. A., Brownie, W. B., Brownlie, W. M., Bruford, J. C., Bruford, J. W., Butler, G. A. F., Bywater, H. E., Cabban, K. E., Callaghan, J. B., Callender, E. R., Callow, M., Carmichael, A. M. E., Chambers, F., Chambers, Tom, Clark, E., Clark, H. M., Claxton, B. A., Clegg, F. G., Cochran, F. R., Cochrane, D. M., Coid, C. R., Coleman, J. G., Collard, S. V., Comben, N., Cooper, Brian S., Corrigall, E. R., Coulden, L. W., Coupland, A., Coward, G. D., Cremlyn-Hughes, H., Cripps, J. M., Crowhurst, F. A., Dall, J. A., Davies, D. Barry, Davison, W. S., Dayus, C. V., Denholm, T. C., Donald, J., Douglas, J. C., Douglas, S. W., Downham, K. D., Duguid, Ian M., Dwerryhouse, W. L., Eaton, G., Eden, Mrs. R., Edwards, J. B., Edwards, S. J., Evans, Derek A., Evans, J. T. R., Evans, K. G. D., Evans, R. K., Field, H. I., Findlay, J. H., Fisher, R. C. U., Ford, Miss Connie M., Formston, Professor C., Freak, Miss Marion J., Furber, T. R., Garside, J. E., Garside, P., Gibson, A. Cameron, Glover, R. E., Gordon, F. A., Griffiths, B. C. R., Groves, T. W., Grunsell, C. S.

Hagan, J. N. J., Hallam, C. W., Hamilton, H. A., Hancock, R. C. G., Harley, W., Harnett, P., Harriss, S. T., Harrow, W. T., Hart, A. W., Hawkesley, M. B., Haxby, Donald, Henderson, G. N., Hewetson, H. R., Hignett, S. L., Hiscock, R. H., Hodgman, S. F. J., Hogg, A. H., Holroyd, Harry, Horrox, M. A., Howell, D., Howie, T. W. T., Hughes, D. A., Hughes, Professor D. L., Hughes, E. E., Hughes, J. H. M., Hughes, T. W., Ikin, P., Ingram, J. McC., Ingram, P. L., Jack, J. A. G., Jennings, S., John, F. V., Johnston, J. B., Johnston, K. G., Jolly, D. W., Jones, Bruce V., Jones, J., Jones, Oliver G., Jones, S., Jones, T. H., Jones, W. Griffith, Jones, W. O., Joshua, Miss J. O., Kelly, Mrs. K. G. R., Kerruish, D. W., Kershaw, C. F., King, A. S., King, J. O. L., Kingsberry, D. L., Kirkwood, A. K., Laing, J. A., Lake, C., Lambie, G., Lamont, A. A., Langley, J. A., Laugier, G. V., Lawfield, F. G. C., Leslie, John A., Lifton, J. M., Littlejohn, Miss Annie I., Llewellyn, D. G., Lloyd-Griffiths, F., Lloyd, H. G., Lucas, J. M. S., McCracken, D., McFarlane, D. F., McGaughey, Professor C. A., McGhee, J. H., McGirr, J. L., McIndoe, J., McKay, W. M., McKellar, J. M., McKinna, W. R., Mackintosh, A. W., McLauchlan, David, McLaren, A., McLean, A., McLeod, A. M. K., McLeod, D., MacMillan, M. Mc., MacPherson, D. A., McShane, H. G., McWilliam, P. N., Madden, D. H. L., Mann, T. Barton, Mather, Arthur, Mathews, H. T., Mathieson, Neil, Melrose, D. R., Menzies, D. W., Milton, J. A., Montgomerie, R. F., Morgan, T. J., Morgan, W. J. Brinley, Morris, E. G., Moss, J. A., Muir, Robert, Mullen, A. L., Murray, J. G.

Nicholson, Professor J. A., Ogg, J. S., Oliver, D. F., Oliver, G. M. G., Orr, David E., O'Neill, A. G., O'Sullivan, K., Parker, W. H., Peatt, E. M., Phillips, L. H., Phillips, R. N., Pittaway, E. M., Plenderleith, J., Pool, W. A., Proctor, F. J., Pugh, C. J., Pugh, L. P., Pugh, P. Storie, Pugh, R. Jones, Ralston, A. G., Rankin, J. Deans, Riley, R. Malcolm, Ritchie, A. Forbes, Ritchie, J. N., Roberts, D. T., Roberts, H. E., Roberts, L. W., Robertson, Professor A., Robertson, R. R., Robinson, P., Robinson, W. G., Robson, W. J. B., Roe, Robert J., Roger, S. A., Roger, Mrs. Anne, Rogers, M. J. H., Rogers, Mrs. Audrey G., Rowe, J. F. W., Rowson, L. E., Scarisbrick, R., Scott, K. E., Scott, W. A., Sellers, K. C., Shields, W. G., Shingler, H. C., Short, G. V., Simons, G., Simpson, B., Simpson, J. W., Sinclair, K. B., Singleton, W. Brian, Slee, A., Smith, G. F., Snodgrass, N., Spreull, A., Spriggs, D. N., Stableforth, W., Stafford, L. P., Steele-Bodger, A., Steward, D. L., Steward, J. S., Stokes, W. P., Sutherland, A., Sutton, D. O., Sutton, E. G., Swaby, R., Taylor, A., Taylor, G. B., Taylor, H. S., Taylor, J., Taylor, J. E., Thomson, Alex., Thomson, A., Thomson, Mrs., E. I., Thurmand, R. C., Tillemont-Thomason, Miss V., Timoney, Professor J. F., Treanor, G. A., Trought, P. T. V., Tuckey, J. B., Tutton, E. A., Tweed, W., Tyrrell, K. M., Uvarov, Miss Olga, Vale, R. H., Vaughan, K. L., Waddington, F. G., Walther, A. L., Ward, A., Watkins, J. M., Watt, D. J., Wharton, M. H., Wheeler, J. M., White, J. B., Wilkins, J. H., Wilkinson, E., Williams, Eric I., Wilson, A., Wilson, A. G., Wilson, Miss M. E. M., Wood, W. H., Wood, J. C., Woods, A., Wooldridge, W. R., Wright, A. J., Wright, M. A., Wyse, G.

Visitors

Anderson, Mrs. T. S., Beswick, W., Boddie, Mrs. G. F., Butler, C. L., Bywater, Mrs. H. E., Callender, Mrs. E. R., Cauchi, Dr. J., Clark, Mrs. H. M., Claxton, Mrs. B. A., Collard, Mrs. S. V., Collins, N. C., Corrigall, Mrs. and Miss E. R., Coward, Mrs. G. D., Crowhurst, Mrs. F. A., Dall, Mrs. J. A., Denholm, Mrs. T. C., Donovan, Councillor A., Eaton, Mrs. G., Eriksen, Dr. and Mrs. Knud, Glover, Mrs. R. E., Groves, Councillor W., Field, Mrs. H. I., Henderson, Mrs. G. N., Hewetson, Mrs. H. R., Hodgman, Mrs. S. F. J., Hole, T. A., Holroyd, Mrs. H., Howie, Mrs. T. W. T., Hughes, Mrs. D. L., Ingram, Mrs. J. McC., Irpan, N., Luke, Mrs. D., Jansen, B. C., Jennings, Mrs. S., John, Mrs. S. V. and Miss, Jones, Mrs. Bruce V., Keeble, Diana, Lasher, Lieut.-Colonel N. A., Leek, Barry F., McCracken, J. H., McKellar, Mrs. J. M. and Miss, McLean, Mrs. A., McLeod, Mrs. A. M. K., Mather, Mrs. Arthur, Mills, C. E., Milosavljevic, Dr. Slavojub, Morris, Mrs. E. G. and daughters, Motton, Mrs. Dora, Oates, W. G. R., Parry, J, Pollard, Jennifer, Pope, D. C., Prasad, A. K., Pugh, Mrs. C. J., Pugh, Mrs. P. Storie, Ritchie, Mrs. A. Forbes, Ritchie, Mrs. J. N., Robertshaw, D., Robertson, Mrs. A., Robertson, Councillor G., Scarisbrick, Mrs. R., Siddall, Councillor F., Thomson, Mrs. A., Thornton, L. N., Trought, Mrs. P. T. V., Waterhouse, C. E., Wilkinson, Mrs. E., Wright, D., Wright, Mrs. A. J.

Suspected Poisoning by Wild White Clover (*Trifolium repens*)

BY

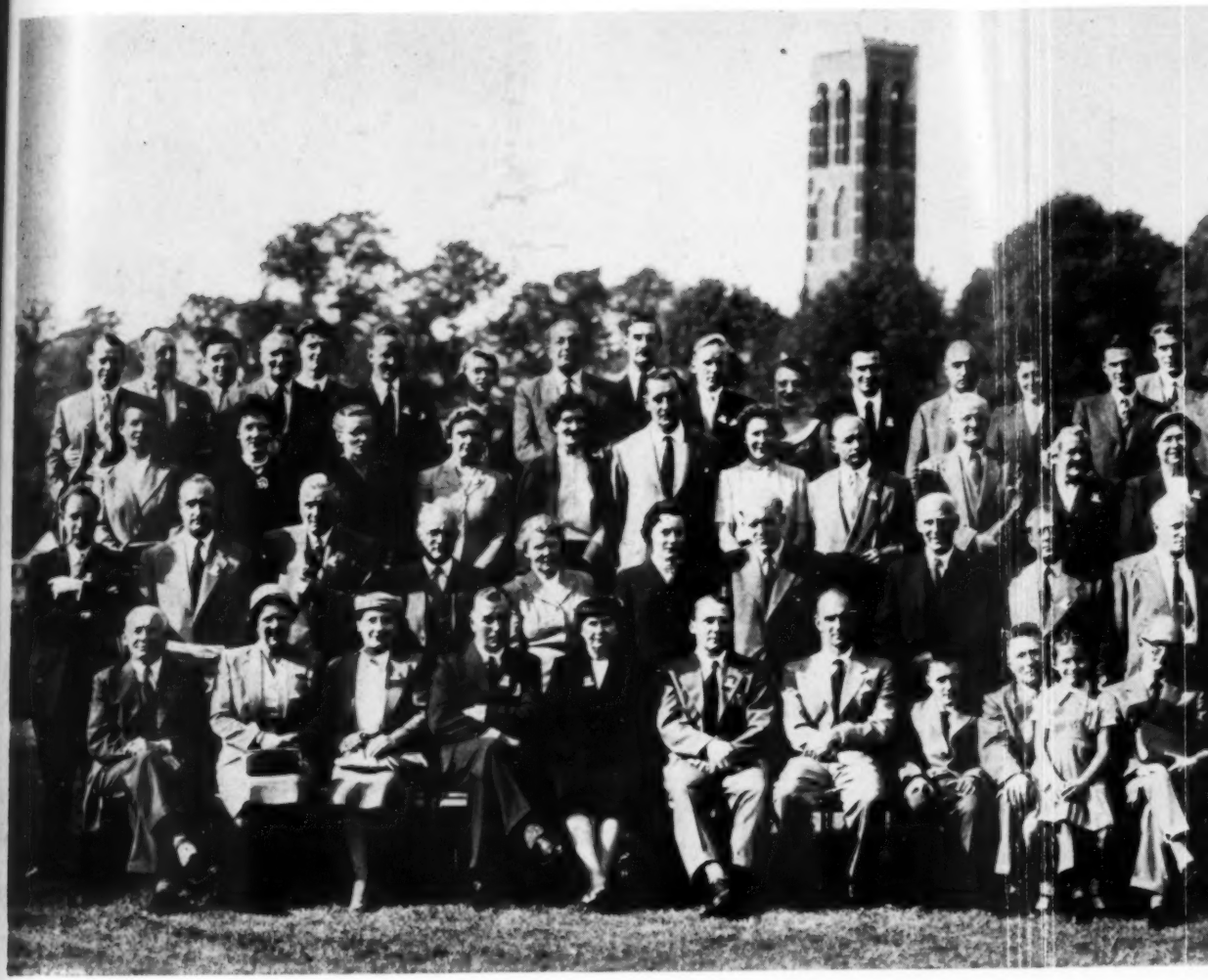
GEORGE HOBSON

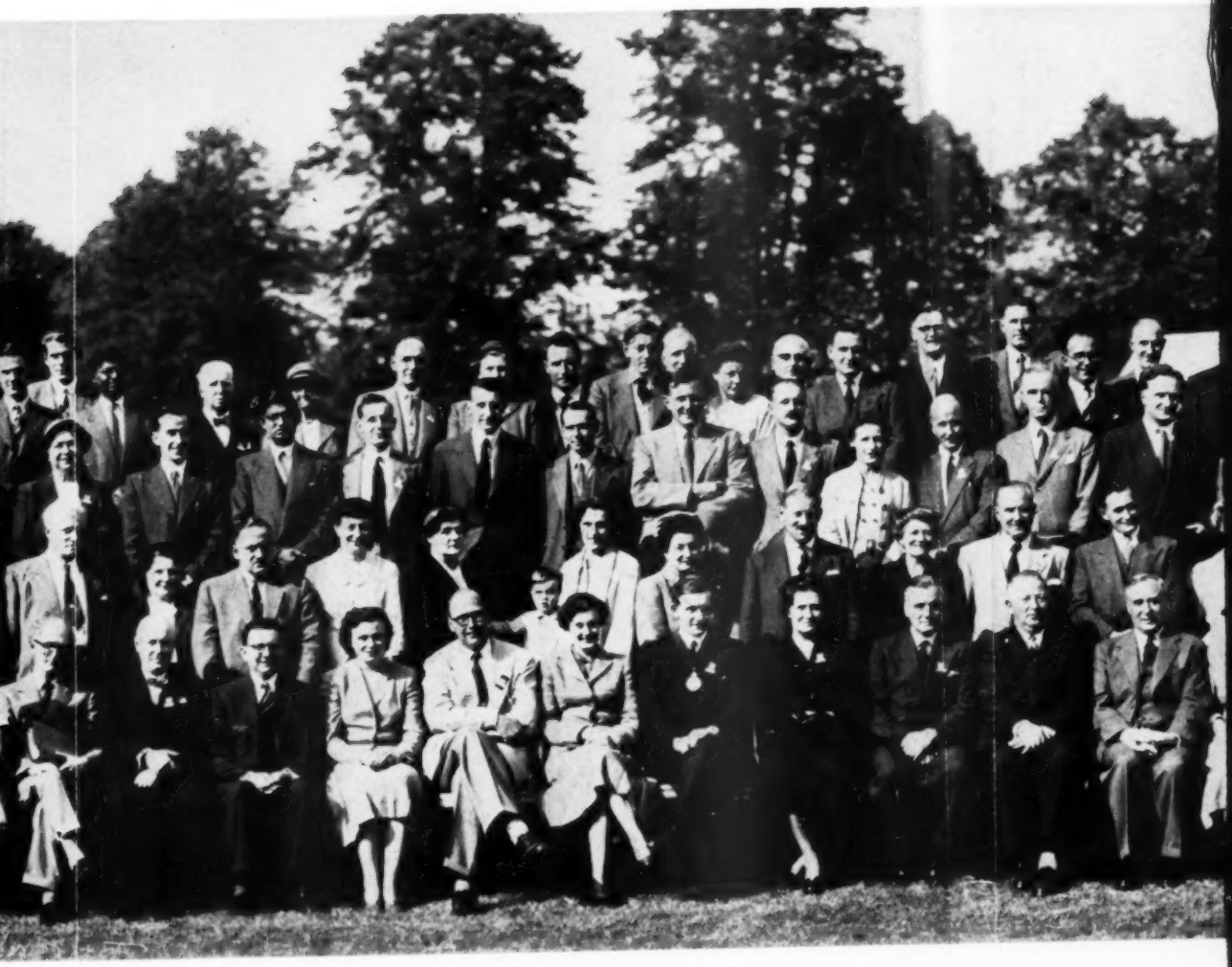
Kiltegan, Co. Wicklow

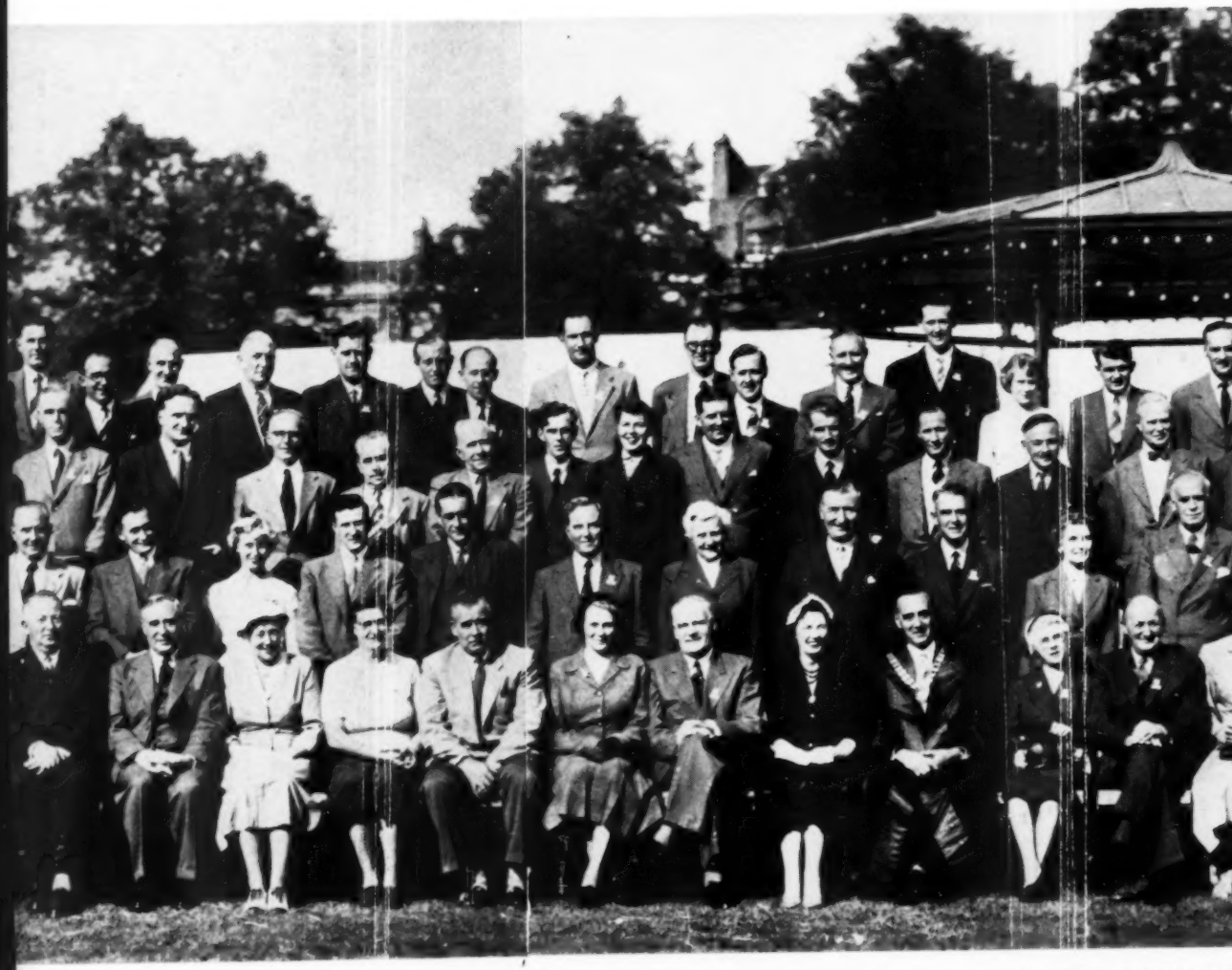
FOR many years I have suspected that wild white clover (*Trifolium repens*) is very poisonous, especially for young cattle and sheep, at the season of the year when it is in full bloom. This year there have been more outbreaks of poisoning than usual, due, in my opinion, to the fact that the white clover has grown profusely, while the grasses have not grown comparatively. Symptoms among calves have included staggering, sometimes scouring profusely, and in later stages blindness. Death follows when prompt treatment is not given. Symptoms have been noticed in calves which have not had direct access to clover, but are suckling cows grazed on it.

I have also noticed a less acute condition in which the calves are seen to be "failing." This variant may be confused with parasitic infestation, but if the pastures are examined it will be seen that there is a profuse growth of clover, which is not eaten down, while all round the field and in the ditches rough grasses and weeds have been eaten down to the soil.

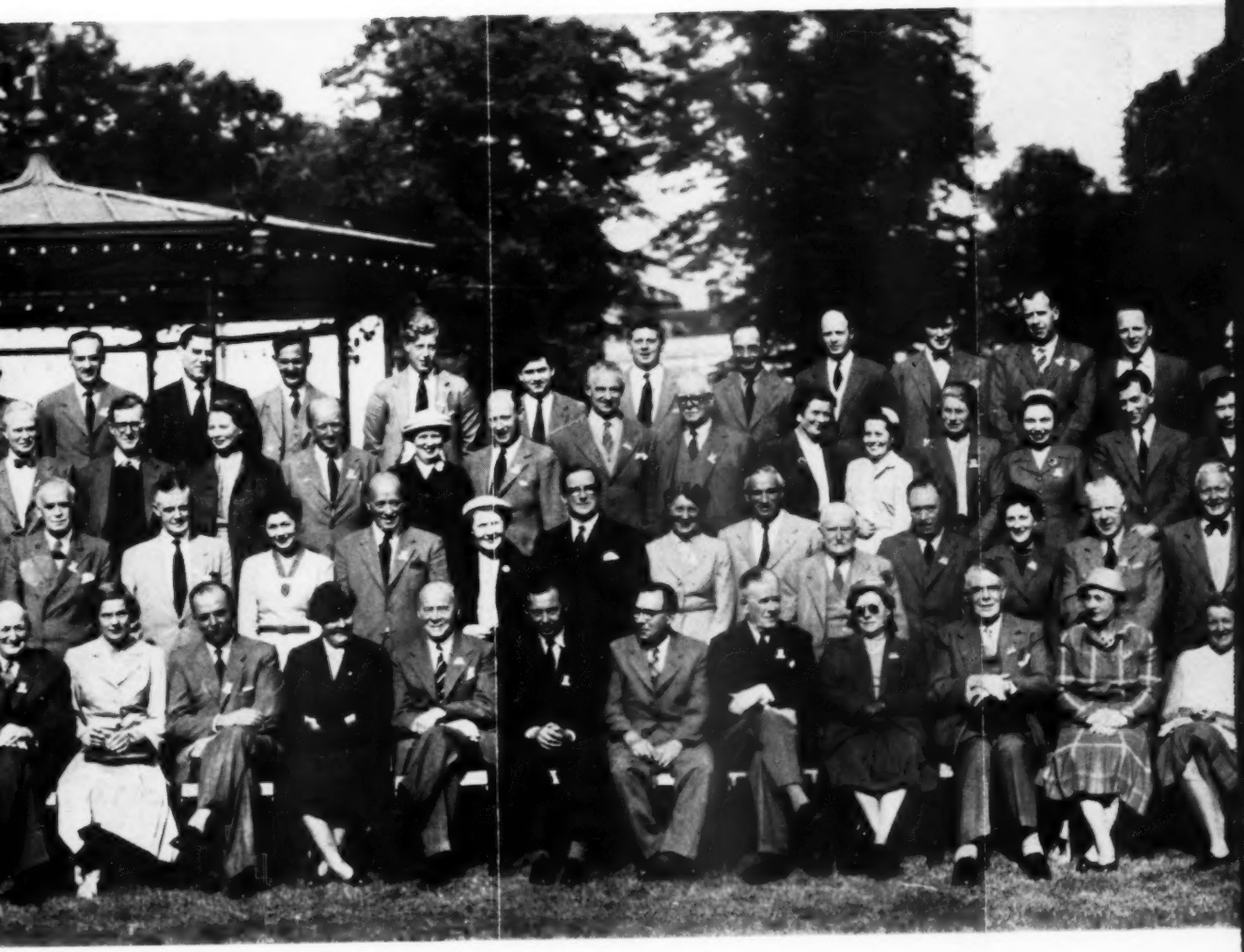
Treatment consists in taking the animals off the clover, stopping all milk to them, and giving them straw to eat and water to drink. In the subacute cases, if the animals are put on rough grazing free from clover, they rapidly improve.







BRITISH VETERINARY ASSOCIATION, ANNUAL CONGRESS, LEAMING



LEAMINGTON SPA, SEPTEMBER, 1956

36997.

Current Literature

ABSTRACTS

Cat Scratch Fever, Reactivation by Intradermal Test. LYON, R. Ll. (1956). *Lancet*. September 15th, 1956. 555-6.

This article describes a case of cat-scratch fever in a girl aged 16 who resided near Inverness. The girl was admitted to hospital with pyrexia and pains in the limbs and joints. She had been bitten on the right index finger by a cat about a month previously. Small puncture marks were still clearly visible in an indurated blush-red area on this finger. Four days after admission to hospital, movement of the right shoulder became very painful and an enlarged tender gland could be felt high up in the axilla, but no lymphangitis was ever demonstrated. Following the development of lymphadenopathy various rashes appeared, and these changed in character with surprising speed. The pyrexia disappeared spontaneously and a few days later the rashes and axillary adenitis were also gone.

On the 18th day after admission, when the patient appeared clinically normal, 0.1 ml. of cat-scratch-fever antigen was injected intradermally into the left forearm. No local reaction was noted but the painful swelling of the glands in the right axilla recurred, together with pyrexia and recrudescence of the rashes. This induced illness persisted for a fortnight without any sign of improvement. Treatment with oxytetracycline was then started, and in 48 hours the temperature was normal, and uninterrupted convalescence followed.

It was impossible to identify the assailant cat from amongst a family of a cat and her three kittens.

Fungous Diseases of Britain (1956). RIDDELL, R. W. (1956). *Brit. med. J.* October 6th, 1956. 783-6.

This paper, which was presented to the Section of Pathology at the Annual Meeting of the British Medical Association, is a review of the present-day position in regard to fungous diseases in Britain. It is pointed out that increasing attention is being paid to these diseases and that their study has been helped by the disappearance of the old confusion in nomenclature.

A review is given of the characteristics of the dermatophyte infections. Ringworm fungi behave virtually as saprophytes for they invade only mature keratin and do not parasitise parakeratotic cells; but an explanation of the rather specific way in which they attack different kinds of keratin has yet to be found. Therapeutically the fungicidal fatty acids have not given the results that might have been expected from work reported in 1947. Innumerable substances of very varied chemical structure are active fungicides and the large number which come to be recommended for treatment of ringworm bears evidence of their inadequacy. This is explained by the failure of topical application to produce concentrations of fungicides sufficient to inhibit fungal growth in the deeper keratin of skin. If this could be achieved the natural process of keratin formation and desquamation would eliminate the fungus parasite. While natural infection produces varying degrees of resistance to subsequent infection, active immunity acquired by inoculation with fungous antigens has not yet been achieved.

Primary aspergillosis of the kind well-known in avian pathology is practically never seen in man. In pulmonary cavitation in man, infection with *A. fumigatus* may lead in some cases to the development of a mycetoma. This consists of a mass of mycelium, usually spherical in shape, which lies within the lumen of the cavity.

The article concludes with brief reference to subcutaneous mycoses, infections by yeast-like fungi, and histoplasmosis and other systemic mycoses.

G. F. B.

BOOK REVIEW

Dairy Farmer's Veterinary Book. BARRON, NORMAN. 269 pp. 75 illustrations. Published by Dairy Farmer (Books) Ltd., Ipswich. Price 21s.

Animal owners of all kinds have always shown, in varying degrees, a tendency to dabble in the "home doctoring" of their charges and books written in the popular style in this field almost invariably have a ready sale. The professional reader of such works is inclined to be biased and somewhat critical if he has reason to consider that an incursion is being made into his realm of activities.

The veterinary profession has not lagged behind other disciplines within the last few decades in a wider appreciation of the problems called upon to be investigated. The farming community also has become better educated and much better informed within recent times, and the veterinary profession cannot afford to ignore this fact. We should not attempt to cloak our art and science in mystery.

It is only by enlightening the farmer on the principles upon which animal health is based, that a true appreciation of the worth of the profession to the agricultural industry can be soundly established and the best use made of the services which are available.

The book is written in simple and lucid language and is very well illustrated. The parts dealing with animal management are particularly good and, although one might perhaps be somewhat critical in respect of some other aspects, we note with pleasure that certain sections which appeared in the first edition have been commendably revised. As in the first edition, the "Farm Recipes," supplied by the Dairy Farmer advisory staff, are included. We would suggest, however, that if any useful purpose is to be served by the retention of these time-honoured and hoary "scripts," they should be brought more into line with modern practice.

The publishers are to be congratulated on the presentation of the book. There has been no economy in paper, the printing is clear and easily read, and the line drawings have been executed in a manner which the reader can readily interpret.

News and Comment

THE CONGRESS PHOTOGRAPH

In this issue of THE RECORD is published the official Congress photograph. Copies may be obtained, price 7s. 6d. each, on application to the General Secretary's office at B.V.A. Headquarters.

NATIONAL SMALL-ANIMAL ASSOCIATION

On Friday last, at B.V.A. headquarters, a group of members met to discuss the establishment of a National Small-Animal Association. The meeting, under the chairmanship of Mr. S. F. J. Hodgman, voted in favour of such an organisation being established by 28 votes to nil; there were three abstentions. Ten letters of apology for absence were received, all from members supporting the establishment of such an organisation.

The chairman expressed the opinion that the President of the body should be a practitioner, and Mr. C. E. Woodrow was unanimously elected. Mr. W. B. Singleton was elected Honorary Secretary. A committee of 12 was formed and will meet early in the New Year to establish provisional statutes which will be put before a general meeting at a later date. Details of the aims and purposes of the organisation will also be published in due course.

PRESENTATION TO MAJOR R. L. GREEN

Major Richard Lewis Green, who was for many years veterinary surgeon to the R.S.P.C.A. in Dudley, was presented recently with the Society's Queen Victoria Bronze Medal and certificate at his home at Bramcote, Nottingham.

The presentation was made to him a week after his 81st birthday by Lieut.-Col. P. T. Clifton, Chairman of the Nottingham and Notts. branch of the R.S.P.C.A., Mr. Harry White, branch Secretary, and Inspector L. Henderson, the branch's chief inspector. They presented him also on behalf of the R.S.P.C.A. Council with a citation in recognition of his 30 years' work for the society in the Birmingham area.

In a tribute to him on his retirement a few months ago, the Chief Constable said: " He has been of great assistance to the Dudley branch of the R.S.P.C.A.; it did not matter whether he was called out day or night the major was there."

LEGAL NOTES

At Wokingham (Berks) Magistrates' Court on November 13th, Miss Dorothy Vera Vincent, of 42, Easthampstead Road, Wokingham, pleaded guilty to practising as a veterinary surgeon when not on the Register or the Supplementary Register. She denied a second charge of using a description calculated to lead the public to believe that she possessed veterinary qualifications.

Prosecuting, Mr. Geoffrey Brain said that the purpose of the 1948 Act was not so much for the protection of the profession as to protect animals from treatment by unqualified people. Miss Vincent was not a member of the Royal College of Veterinary Surgeons and was not on the Supplementary Register. A few months ago she applied to the Royal College, but the Supplementary Register closed in 1949. She had worked with a Mr. Lane who was in business as a veterinary chemist; after his death she altered a sign outside the house to " D. V. Vincent, late George Lane, veterinary chemist," and people went to the house to have animals treated.

The defendant said she had 40 years' experience with animals. Before the 1948 Act she had done minor operations, but not since then. She had no intention of misleading the public into thinking she was a veterinary surgeon.

Two witnesses gave evidence that Miss Vincent had cut dogs' claws and scaled their teeth, but had never pretended she was a veterinary surgeon.

For giving treatment to a cat, the defendant was fined £2, with 10s. costs; on the second charge she was found guilty and fined £1 with 2 guineas costs. She gave an undertaking to take down the sign from her house.

★

Two veterinary surgeons, Mr. Andrew Strang of Crewe, and Mr. Eric Shirley of Middlewich, gave evidence recently at Middlewich (Cheshire) Magistrates' Court in a case in which a farmer was summoned for failing to observe the Anthrax and Infectious Diseases Order, 1938. The case concerned a cow which the defendant believed to have had grass staggers. A technical witness who bled the animal said that only when he saw the enlarged spleen did he suspect anthrax. Mr. Strang said there was only one way of being certain of the presence of anthrax, and that was by microscopic tests. Mr. Shirley said it would not be possible to take a look at an animal and say whether it had anthrax or grass staggers. A farmer's normal reaction, he thought, would not be to think of anthrax in a live animal. For the defence it was suggested that no evidence had been forthcoming to show that any of the defendants knew or suspected that the cow had died of anthrax. The magistrates accepted that plea and dismissed the case.

UNIVERSITY NEWS

London

B.Sc. (Veterinary Science), October, 1956

Barnett, Keith Chartres; Blackmore, Davis Killoch; Bowles, Jeffrey; Bruford, James Caisley; Hollands, John Grahame; Mullen, Paul Anthony, and Prasad, Awadh Kishore.

The following Students have passed in Part I only:—

Clark-Lewis, Anthony Victor; Gray, John; Newey, Richard Martin.

The following Student has passed in Part II only:—

Teale, Michael Leslie.

Bristol

Council have approved the appointment of Dr. C. S. Grunsell, M.R.C.V.S., Senior Lecturer in Hygiene and Preventive Medicine in the University of Edinburgh Royal (Dick) School of Veterinary Studies, to the Chair of Veterinary Medicine. Dr. Grunsell takes up his appointment on December 1st. Some details of the new professor's career are given below.

Among other appointments are the following:—

Mr. R. R. Ashdown, B.V.SC., M.R.C.V.S., Assistant Lecturer in Veterinary Anatomy; Mr. J. C. Boutflower, B.V.SC., M.R.C.V.S., Junior Fellow in Veterinary Surgery; Mr. L. N. Payne, B.V.SC., M.R.C.V.S., Research Assistant in Clinical Pathology, and Mr. G. S. Walton, B.V.SC., M.R.C.V.S., Junior Fellow in Veterinary Surgery.

Professor C. S. Grunsell

The appointment of Dr. C. S. Grunsell, previously Senior Lecturer in the Department of Hygiene and Preventive Medicine in the Royal (Dick) School of Veterinary Studies, to the Chair of Veterinary Medicine at Bristol, raises to high academic honour an already successful teacher with past experience in practice.

Professor Grunsell was born in 1915, educated first at the International School in Shanghai and later at Bristol Grammar School. He entered the "Dick" in 1932 and graduated M.R.C.V.S. five years later. For a few months he held the post of Demonstrator in the Department of Anatomy in the College, and then became assistant to Mr. James Martin, in Shropshire. In 1939 Dr. Grunsell started in general practice on his own account at Glastonbury, and soon began to build up a substantial clientele.

Between 1944 and 1948 he carried out a number of field investigations in collaboration with the laboratory and advisory services of the Ministry of Agriculture, and in the latter year was appointed Demonstrator in the Department of Medicine at the "Dick." His return to university life, where he enrolled as a Ph.D. student, intensified a long-standing interest in teaching and he did not return to practice.

Two years later he was appointed Senior Lecturer in the Department of Hygiene and Preventive Medicine under Professor Robertson, whose deputy he became in due course. He has made a number of contributions to the literature in this and other journals.

Professor Grunsell has for long been an active member of the B.V.A. While in practice he served on the Council of the Mid-west Division, and subsequently he has been Honorary Secretary/Treasurer of the Scottish Metropolitan Division. He is a member of the Council of the B.V.A., and serves on the Home Appointments committee.

PROBLEMS OF SHEEP

An audience of 130 farmers attended at Hanbury Institute, Church Langton, last week to hear Mr. H. B. Parry speak on "Pregnancy Toxaemia and other Sheep Problems." Mr. C. Kendall was in the chair.

The speaker said that the main noticeable symptoms of pregnancy toxaemia are that affected sheep stop chewing their food, and develop defective vision, usually more pronounced in one eye than the other. Later, nervous tremors occur, and eventually the ewe is unable to rise unaided. The disease only occurs in flocks where the average lamb drop exceeds one and three quarter lambs per ewe.

Mr. Parry pointed out that control of the disease was entirely a matter of management. Among the control methods he suggested were:—

Ewes should not be allowed to get too fat in the early stages of pregnancy, but should be kept in level store condition. The flock should have plenty of exercise, with a dry lie at night, and not too much paddling through wet, muddy gateways. Foot-rot in the later stages of pregnancy was dangerous, and must be avoided.

It was important to start supplementary feeding two months before lambing was due to commence. A hand-fed ration should contain 10 per cent. protein. The cost of this extra feeding, with ration priced at £34 a ton would be 7s. 6d. per ewe.

RABBIT CLEARANCE CAMPAIGN

At a recent Press conference in London, Lord St. Aldwyn, Joint Parliamentary Secretary to the Ministry of Agriculture, Fisheries and Food, made a statement on the campaign against wild rabbits in the course of which he said:—

"There are more rabbits about than last year. The increase seems to have been most marked in the midlands and the south-east. The increase has not, however, been as great as was feared, and there were few reports this year of serious rabbit damage to crops and pastures. Nevertheless, diseased rabbits are appearing in areas where the first wave of myxomatosis took a heavy toll and the virulent form is now appearing in Nottinghamshire and Hampshire where attenuated strains had previously been found. These two counties are the only ones where rabbits affected by the virus in a less virulent form have been found in considerable numbers, although the odd rabbit with the attenuated strain has been found in a few other counties. The proportion of samples of rabbits' blood from different parts of the country which contain antibodies to myxomatosis continues to increase. These are disturbing developments which indicate that myxomatosis will tend to play a diminishing part in reducing the rabbit population.

"Predators have also played a part. Research shows that rabbits at one time formed about half of the fox's diet and the fox will take a rabbit when he finds one. Stoats and farm cats are taking a toll, and in parts of Wales, buzzards also. Because of their greater breeding rate, rabbits can soon outstrip the predators and, quite obviously we cannot rely on them to keep the rabbits down.

"There are still some countrymen who are not in favour of exterminating the rabbit. I should remind them 93 per cent. of the country is now included in rabbit clearance areas, in which occupiers are required by law to destroy rabbits on their land. The undesignated areas comprise parts of Cheshire,

Lancashire, Staffordshire, and the West Riding, and it is expected that these, too, will be designated before long.

"The coming months will provide once again an opportunity for an all-out drive against the rabbit which, of not wiped out, will build up to menace our farms and forests. The damage they will suffer in after years will depend on the number of rabbits that are missed this winter."

QUALITY OF MILK

Professor H. D. Kay, Director of the National Institute for Research in Dairying, speaking in Birmingham on November 15th, suggested that, within a reasonable time, all dairy farmers would be paid for milk on the basis of its quality. He added:—

"I think it is about time we stopped worshipping what has been a bit of fetish in recent years—gallonage, just volume. As a result of this worship we have got an awful lot of milk which is not up to standard, as any responsible farmer will admit. One has to remember that the chief reason for the existence of this vast industry is that milk is a first-class food. And the value of milk as a food depends upon what it contains. It does not depend on the water."

A PRIZE FOR CLINICIANS

The late Mr. R. W. Hall, veterinary surgeon, of Barry, has left the sum of £1,000 on trust to the Royal College of Veterinary Surgeons. The income from the trust is to be used every two years to provide a prize for the advancement of clinical work. We understand that the Royal College has accepted the bequest in principle.

MR. FREDERICK FRANCIS

The funeral of Mr. Frederick Francis, whose death on November 11th was recorded in our last issue, took place on November 14th at the Roman Catholic Cemetery, Kensal Green. The family was represented by his only brother, Mr. Thomas Francis, and among personal friends were: Mr. T. Cartmael and Mr. W. Brooks (representing the Blue Cross), Mr. P. J. Quigley, M.R.C.V.S. (representing the Blue Cross Animal Hospital), Mr. J. D. Fulton, M.R.C.V.S. (representing the Central Veterinary Society), and Dr. Tom Hare (representing the B.V.A.). There were present also the staffs of Blue Cross clinics of Tottenham, Hammersmith, and Paddington, and Mr. Onions, who represented the Working Men's College. There were also several old friends, representatives of the theatrical profession.

Dr. Tom Hare writes:—

Once, in talking of his career on the stage, Fred Francis assured me that he had not played George in Jerome K. Jerome's *Three Men in a Boat*, not forgetting the dog. He was cast for, and lived the part; or so it seemed to me. In his journey through life he rowed upstream; happy when the sun shone, uncomplaining when it rained; hoping one day to achieve his boyhood ambitions to be a veterinary surgeon and to own a dog. On leaving school at Bury, Lancashire, a passing whim took him to sea and thence to the army through the 1914-18 war. Returning home from the army he met his old school friend Tommy Handley and listened to tales of the theatre. He was attracted to the humanity, gaiety, movement, and light of the stage, where he developed the histrionic sense, melodious voice, and urbanity which so pleased his friends. Increasingly his youthful fondness for pet animals intruded upon his work in repertory until one day in his middle 30's he registered as a veterinary student. For some years he worked part time at the Royal Veterinary College, part time on the stage. Veterinary art to such a temperament was a joy, its science an incomprehensible burden. The strain began to tell and was heightened by the illness of his devoted wife. He was alone, a widower, when he graduated in 1940.

After graduating M.R.C.V.S. he was appointed veterinary surgeon to the Blue Cross Animal Clinics in London, with his headquarters and home at 403, Harrow Road. To his employers and their clients he interpreted and upheld the agreements with the B.V.A.; to his professional colleagues, with equal fearlessness and objectivity, he explained what he deemed reasonable or unreasonable in the activities of the animal welfare societies. He held to his course against the stream of controversies between the profession and the welfare societies during the 1940's, firm in the faith that one day both parties would come into the calm waters of mutual respect and understanding. By his innate fairness, modesty, and honesty, he acquired the respect both of his society and his profession.

A year before his death Fred had a heart attack and retired on pension; the Blue Cross generously allowed him to retain the flat at Harrow Road where he was so comfortable with his old friends, Mr. and Mrs. House. As his strength returned he began the course at the Working Men's College, Camden Town, for the honours degree in economics; he also began a thesis for the Fellowship of the Royal College of Veterinary Surgeons. Fred had the pluck which wins and the benevolence which inspires. His work of the past 16 years for a better understanding between the veterinary profession and the animal welfare societies must and will go on.

Professor McCunn writes:—

Fred Francis, a great little gentleman, died peacefully and happily on Sunday morning, November 11th, 1956. He had been in failing health for some years owing to heart trouble, and he passed away in the hospital where he had been an "in" patient since October 5th.

Fred came from Lancashire where his father was a Church of England clergyman. Intending to follow a career at sea he was apprenticed, and as was the custom of that time, he served before the mast in a sailing ship and visited many parts of the world. It was a hard life and he said that the skipper and the mate knocked the rudiments of seamanship into the apprentices with the aid of a stout "rope end."

Reluctantly, and for health reasons, he had to relinquish this type of life. He was attracted to a career in the veterinary profession but this was denied at that time by economic factors. He was interested

also in the stage, and as this offered paid employment and an interesting life he joined a travelling company and toured the country playing all manner of parts in a variegated assortment of plays ranging from Shakespeare to lurid melodrama such as *The Silver King* and *Maria Marlin* in the *Red Barn*. He told me it was a great life and described the many parts he played. The plays were changed two or three times a week; sometimes there would be one for the afternoon show and another for the evening performance. Changes would often be made at short notice and the actors had not time to learn their lines. They would have to extemporise and prompt one another whilst on the stage and in full view of the audience. Sometimes members of the audience would prompt.

There is no doubt that Fred was a good actor and also a successful one, for after a few years he was able to put his own shows on the road. He had a great helpmate in his dear little wife who was a gifted actress and also a ballerina of considerable merit. They worked together so successfully that he was able to acquire a modest competence, retire from " the boards," and attempt to gratify a new ambition, that of becoming a veterinary surgeon.

He entered the Royal Veterinary College in 1925, and to help with the family finances his wife established a school of dancing in London. Fred played his part in this venture also, and for several years their pupils formed the dancing troupes at the Scala Theatre pantomimes. Unfortunately his capital was depleted by unlucky investment and he had to withdraw from the College. He took misfortune like a good " trouper " and did any sort of job that came along from washing cars to playing small parts on the stage and in films. In his spare time he attended to the pets of his theatrical friends and he practised as an unqualified man in the St. John's Wood area. Soon he was able to devote all his time to this work, and he was so successful that he was able to build up his resources again and in 1938 return to his studies at the Veterinary College. He qualified M.R.C.V.S. in 1940.

The Second World War had broken out and times were bad for veterinary surgeons. There was much unemployment, he was well over 40 years of age, and he had given up his unqualified practice and connexions when he resumed his studies. He was glad to take a post with Our Dumb Friends' League to work at their clinics and also at Sister Mabel's Clinic. He told me how pleased he was to get a job of any sort in his profession and he was always grateful to the League. This type of work was to become the main part of his professional life. The League gained an intensely loyal and conscientious servant and the animals a kind and competent doctor. He did not entirely forsake the stage, but work in that direction became his hobby and relaxation. He played and produced at the Little Theatre in Notting Hill Gate, and he was one of the team who took Shakespeare to the hotels and public houses. They played, as did the actors in Shakespeare's own time, without elaborate " props " and to a wide and appreciative audience.

During the last few years his heart began to fail. He fought a great fight, for this dapper, happy, and generous little man was full of the courage that has made Britain great. One thing alone could get him down and that was his constant grief at the loss of his beloved wife. He cherished her memory more than any other thing.

When his heart condition took a turn for the worse and it was judged to be not safe for him to work, the Committee of the Dumb Friends' League made generous provision for this trusted and loyal servant and he was freed from financial worry. It is my privilege and pleasure to make this known.

Fred lived a full and happy life; he met all his troubles, except one, with a joke and a smile. He died whilst laughing with his nurse about his own frailty. I shall treasure his memory, and be ever grateful that I was privileged to be one of his intimate friends.

Miss Marion Freak writes:—

The death of Frederick Francis has deprived both the profession and the real cause of animal welfare of the services of a man who can ill be spared at the present time.

His failing health had lately made him frail in looks; an appearance which belied the true resilience of spirit that was the essence of the man. He will be remembered by many Fellows of the " Central " for his valuable, lively, and indeed often explosive, interventions in any discussion on animal welfare.

For many years he had waged a courageous battle with his own diminishing health and as recently as a fortnight before his death he wrote protesting vigorously that his enforced stay in a hospital bed was no longer necessary. Indeed on previous occasions he had been known to discharge himself from hospital when his medical advisers would not allow him what he regarded as a reasonably prompt return to activity.

As a fellow member of the Central's animal welfare sub-committee, I came to know well his burning zeal for his profession. There could be no division of loyalty for him. The animal's welfare came first, indivisibly linked with the honour and dignity of the profession. Nothing else mattered and his verbal broadsides could be equally devastating whether delivered against the " vested interest " of private practice or the " vested interest " of welfare societies.

Always after such an outburst he would describe himself contritely as an awkward fellow and offer to resign, with that personal humility which so often goes with an ardent belief in a righteous cause.

Those of us who came in close contact with him will always look back with affection and respect to a charming character of utter integrity, and we shall sadly miss his stimulation and advice.

MR. NEIL MATHIESON

Mr. N. M. Black writes:—

The sad news of Neil Mathieson's passing must have been a great shock to his many friends in the profession and outside it.

As brother Scots, the bond between us was stronger than might have arisen through our relationship in professional and business circles, but his colourful personality, droll sense of humour, and great love of life endeared him to a wide and varied circle of friends.

Neil was a patriot, "sometimes with an excess of exuberance" as he might himself have said. He would not have objected to being referred to as a "character," but in his more serious moods he commanded a great deal of respect for his well-considered views, which were invariably expressed in a fine turn of phrase.

The profession and the industry have lost much by his untimely death.

PERSONAL

Births

GRIPPER.—On November 17th, 1956, to Anne, wife of J. N. Gripper, B.SC., M.R.C.V.S., of Guildford, a son, Peter Lowery, a brother for David.

HAXBY.—On November 12th, 1956, to Barbara, wife of Donald Leslie Haxby, M.R.C.V.S., at Newark, Notts, a daughter, Joanna Barbara.

HOOPER.—On October 27th, 1956, at Victoria College Hospital, Sidmouth, to Pat, wife of Robert B. Hooper, M.R.C.V.S., of 5, The Marino, Cotmaton Road, Sidmouth, a son, David Ashley—a brother for Sally.

REDMOND.—On November 10th, 1956, to Audrey, wife of Michael Redmond, M.R.C.V.S., of Stratford Road, Salisbury, a daughter, Bridget Judy Rose.

Marriage

WARD—BOURNE.—On Tuesday, November 20th, at Holy Trinity Church, Bickerton, Nr. Malpas, Richard Keith Wood (Lieut. R.A.V.C.), B.V.SC., M.R.C.V.S., to Margaret Alice Bourne of Pool Farm, Bickerton.

COMING EVENTS

November

26th (Monday.). Annual Dinner of the Centaur Society at the Grand Hotel, Bristol, 7 p.m.

28th (Wed.). Meeting of the South-East Midlands Veterinary Medical Association at Franklin's Gardens Hotel, Northampton, 7.30 p.m.

30th (Fri.). Ordinary General Meeting of the Royal Counties Division, B.V.A., at the Caversham Bridge Hotel, Reading, 2.30 p.m.

December

4th (Tues.). Special Meeting of the Technical Development Committee, B.V.A., at 7, Mansfield Street, London, W.1, 10.30 a.m., to discuss bovine mastitis.

5th (Wed.). Meeting of the Ayrshire Division in the Veterinary Investigation Dept., West of Scotland Agricultural College, Auchincruive, 7.30 p.m.

6th (Thurs.). General Meeting of the Central Division, B.V.A., at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.

General Meeting of the Western Counties Division, B.V.A., at the Rougemont Hotel, Exeter, 2.30 p.m.

7th (Fri.). Second Meeting of the British Veterinary Poultry Association in the main conference room at Olympia, London, 3 p.m.

12th (Wed.). General Meeting of the Midland Counties Division at the Birmingham Medical Institute, 154, Great Charles Street, Birmingham, 2.30 p.m.

Ordinary General Meeting of the Sussex Veterinary Society at the Adelphi Hotel, Brighton, 2.30 p.m.

14th (Fri.). Annual Dinner Dance of the North Wales Division at the St. George's Hotel, Llandudno.

Ordinary General Meeting of the South Wales Division at Cardiff.

19th (Wed.). Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at the Society's House, 5 p.m.

20th (Thurs.). Annual Dance of the V.V.B.F. Ladies' Guild, Dumfries Division, in the Cairndale Hotel, Dumfries.

January

24th (Thurs.). Annual Dinner and Dance of the V.V.B.F. (Northern Division) in the Northern Hotel, Aberdeen, 7.30 p.m.

23rd, 24th and 25th (Wed., Thurs. and Fri.). Quarterly Meetng of the Council of the British Veterinary Association in London.

FOOT-AND-MOUTH DISEASE

The area described in the schedule below is declared to be an Infected Area for the purpose of preventing the spread of foot-and-mouth disease:—

IN THE COUNTY OF CARMARTHEN

The Boroughs of Carmarthen and Kidwelly.

In the Petty Sessional Division of Carmarthen County: The parishes of Conwyl Elfed, Llanpumsaint, Llanllawddog, Abernant, Newchurch, Abergwili, Llangunnor, Llanarthney, Llanddarog, Llangendeirne, Llandefeilog, Llangain, Llangynog, Llanstephen and St. Ishmeal, so much of the parish of Pontyberem as lies within the Petty Sessional Division, and so much of the parish of Trelech-a'r-Bettws as lies to the south and east of the road running from West Cilrhedyn via Pen-y-ffin, Trelech, Dinas-fach, and Felindre to Llanwinio excluding the said road.

In the Petty Sessional Division of Llandilo: The parish of Llanegwad.

In the Petty Sessional Division of Llanelly: The parishes of Pembrey and Burry Port Urban, so much of the parish of Pontyberem as lies within the Petty Sessional Division, and so much of the parish of Llanelly Rural as lies to the north and west of the road running from Llannon via Sylon and Five Roads to Trim-saran including the said road.

In the Petty Sessional Division of St. Clears: The parishes of Laugharne Township, Llanddowror, St. Clears, Llangynin, and Mydrim, and so much of the parish of Llanwinio as lies to the south and east of the road running from Trelech via Felindre, Llanwinio, Cwm-bach, and Cwm-felinmynach to Llanboidy excluding the said road.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Caernarvon. Bryn Gwlchmai, Mynydd Llandegai, Bethesda (Nov. 15).

Cumberland. Bassenthwaite Hall Farm, Bassenthwaite, Keswick (Nov. 15).

Monmouth. Pentre Bach Farm, Cwmbran, Newport (Nov. 14).

Salop. Brook Gate Farm, Plealey, Pontesford (Nov. 14).

Yorks. Elmhurst Farm, Cawthorne, Barnsley (Nov. 15).

Fowl Pest

Ches. Hall o'the Heath Farm, Haslington, Crewe (Nov. 13).

Essex. 13 and 16, Accommodation Road, Boxted, Colchester; 27, Straight Road, Boxted, Colchester (Nov. 15).

Lancs. Paradise House, Woodplumpton, Preston; Ivy House, Lightfoot Lane, Bartle; Lewth House Farm, Lewth Lane, Woodplumpton (Nov. 12); Broadfield, Smallwoodhey, Pilling; Hill Top Farm, Barton, Preston (Nov. 13); Kitty's Farm, Chapel Lane, Longton; Tan-y-Bryn, Land Lane, Longton; Beesleys Farm, Haighton, Grimsargh; Green House Farm, Haighton, Grimsargh (Nov. 14); Haydock Grange, Cottam; Lambrigg, Hornby Lane, Inskip; Clarksons Farm, Haighton, Grimsargh; Grange Cottage, Pilling Lane, Pilling. Fingerpost Cottage, Mere Brow, Tarleton; The Bungalow, Ratten Lane, Hutton; Fernbank, Woodplumpton, Hilberry Nurseries, Carleton Crossing, Blackpool; Slalir House, Haighton, Grimsargh (Nov. 15).

Swine Fever

Bucks. Riding Court Farm, Datchet, Slough (Nov. 15).

Cambs. Block B, School of Veterinary Medicine, Madingley Road, Cambridge (Nov. 19).

Essex. 209, Main Road, Hawkwell, Hockley (Nov. 14); Hargraves Farm, Stansted (Nov. 19).

Lancs. Rough Holm Farm, Pilling, Preston (Nov. 19).

London. Piggeries, Hendon Borough Council Refuse Disposal Works, North Circular Road, N.W.2 (Nov. 13).

Derby. Manor Farm, Snitterton, Matlock (Nov. 19).

Herts Staples, Raffin Green Lane, Datchworth (Nov. 19).

Norfolk. Marsh Farm, Halvergate, Norwich (Nov. 16).

Staffs. Hill Farm, Hardiwick, Sandon (Nov. 12); 23, Hollywell Street, Hurst Hill, Coseley, Bilston; Nobut Farm, Leigh, Stoke-on-Trent (Nov. 16).

Yorks. Nunnery Piggery, Broad Oak, Sheffield, 9 (Nov. 14); Grange Farm, Wincobank Lane, Sheffield, 5 (Nov. 19).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

Hypomagnesaemia

Sir,—It is accepted generally that two types of hypomagnesaemia occur in cattle. The first is encountered in autumn and is believed to arise from a deficiency of magnesium in the diet. The cause of the second, the more severe and frequently fatal type, is obscure; it appears with great frequency during the spring and early summer when cattle are eating large quantities of rapidly growing herbage. Although this letter concerns itself mainly with the second type it is wise to take both into consideration, and now is the season to begin observation.

The purpose of this communication is to draw attention to one clinical feature which was recognised in my father's days as being fairly constant and is still so in my own experience, although nowadays it is seldom mentioned. I refer to the frequency of the statement by the owner or cowman that he noticed the animal in oestrus within the past 48 hours.

In some instances the history may be that a number of animals were observed " riding " and in a state of sexual excitement. Occasionally, several cases have followed this in rapid succession. I am well aware that the disease is not confined to non-pregnant cows. Recently calved or pregnant animals may be involved and in these one would not expect to obtain the same history. Nevertheless, it has been within my own experience that quite a number of pregnant cows have exhibited oestrus, to the surprise of the attendant, shortly before going down with an acute attack. In actual fact conditions within the uterus have little bearing on the matter. In spite of the general belief, the development of follicles within an ovary does not come to a standstill during the two months following parturition. Follicles of some size may also be present, or may come and go, throughout some part or the whole of pregnancy, usually in one ovary, and follicular development with actual ovulation occurs not infrequently during the first month after calving, especially in the Channel Islands breeds, although the usual signs of oestrus may not be markedly evinced.

Quite frequently it is difficult to obtain accurate records of oestrus, particularly in the beef breeds. As the empty cow normally shows some signs every 21 days, one should, in theory, be able to secure a history of oestrus within 48 hours in approximately 10 per cent. of all such cows which show symptoms of the disease. Should a further and more extensive observation prove that from 50 to 65 per cent. of cases encountered in empty or recently calved cows are preceded by signs of oestrus then the possible indication may be that some connexion exists between the onset or precipitation of the nervous syndrome and follicular development in the ovary.

I invite all interested practitioners to inquire into the date of the last observed oestrus when called to a case of the disease. If, during next summer, some will be good enough to send the result of their observations either to the honorary secretary of the B.V.A. or to myself, a summary can be published in THE VETERINARY RECORD and will go some way towards determining whether or not ovarian activity is one of the factors associated with the aetiology of the condition.

Yours faithfully,

R. H. SMYTHE.

6, Peveril Drive,
The Park,
Nottingham.

November 14th, 1956.

Anaesthesia and Its Application in Small-animal Practice

Sir,—The excellent article in THE VETERINARY RECORD of November 17th, "Anaesthesia and its Application in Small-animal Practice," recalls to mind a case I had in a racing Greyhound some time ago. This animal crashed into the rails at the end of a race and sustained a wound extending from just above one eye to the base of the opposite ear. The skull was exposed throughout the length of the wound and extensive suturing was obviously required. Working single-handed in a predominantly agricultural practice, my choice of anaesthetics is limited, and I chose pentobarbitone sodium in preference to thiopentone because the suturing was obviously going to take some time. Induction was normal and the amount of pentobarbitone sodium administered to achieve anaesthesia was as expected. However, the animal remained in a state of complete anaesthesia for 24 hours and was narcotised for a further 24 hours. Having recovered, there were no apparent ill effects. The dog has won several races since and there is obviously no kidney or circulatory disease.

I have always assumed that the reason for the extreme length of the recovery time was due to the fact that the dog was anaesthetised within half an hour of finishing its race.

May I ask the authors whether an animal which has undergone recent physical exertion should be added to the list of poor anaesthetic risks?

Yours faithfully,

Grove Dene,
Preston Road,
Yeovil.

ROBERT A. BROWN.

November 19th, 1956.

Content of "The Veterinary Record"

Sir,—Mr. Nye's letter under the above heading brings to my notice the third article which has been rejected by THE VETERINARY RECORD in the past few months.

As joint author I recently submitted an article on a completely new form of penicillin; my co-author was a veterinary surgeon employed by the manufacturers of the drug and an acknowledgment was made to the firm at the end of the article for supplies of the drug. Publication was refused. I believe, though I have not been told officially, that the reason for rejection was that the scrutineer thought it gave the manufacturers publicity. This article contained information which has never previously been published in this country and was surely of interest and value to potential users of the drug.

The other rejection was that of a paper read at a meeting of the Central Veterinary Society. This was refused, I believe (again I have no official information) because the author held unorthodox views on his subject. Both these articles, after editing by the paper concerned, have since been published in another veterinary journal.

We are frequently told that THE VETERINARY RECORD has an academic slant because too few articles are submitted by clinicians. It is no encouragement to practitioners to take the time and trouble to write on clinical matters, knowing that their articles may be refused on the opinion of a scrutineer.

Most of us in practice rarely find time to prepare communications for THE VETERINARY RECORD, but we should like to feel that we have the right to express our views on cases and treatments in our own journal.

Yours faithfully,

15, Glendower Place,
South Kensington,
London, S.W.7.

W. M. TAYLOR.

November 19th, 1956.

[Our correspondent is mistaken; papers are not judged by arbitrary criteria. Except in cases of immediate acceptance, every paper is read by two scrutineers acting independently of each other. Where differences of opinion occur a third scrutineer, usually a member of the Editorial Committee, is asked to act as referee. It is not claimed that this system is perfect, but it seems the fairest that can be devised, and follows the practice of most responsible journals. —*Editor.*]

The 1956 Caribbean Congress

Sir,—How refreshing it was to read Dr. Taylor's interesting article on the Caribbean Congress. Would that all the contributors to THE RECORD wrote such clear invigorating prose, it would make the dullest article a joy to read.

Yours faithfully,

R. K. SHARRATT.

31, Cranmere Road,
Plymouth.

November 12th, 1956.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN
Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-Mouth	Fowl Pest	Sheep Scab	Swine Fever
16th to 31st October, 1956		22	1	1	46	—	20
Corresponding period in	1955	50	1	—	40	—	42
	1954	20	—	—	15	—	43
	1953	9	—	1	37	—	84
1st January to 31st October, 1956		1,183	11	128	603	—	650
Corresponding period in	1955	630	6	6	465	—	1,224
	1954	257	4	12	630	—	1,245
	1953	528	—	29	790	—	2,436